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1956-1957

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(Term expires September 1957)

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THE Association was organized in Boston, Mass., on June 21, 1882, with the object of providing its members with means of social intercourse and for the exchange of knowledge pertaining to the construction and management of water works. From an original membership of only TWENTY-SEVEN, its growth has prospered until now it includes the names of over 1000 men. Its membership is divided into six classes, viz.:

A Member shall be an officer or employee of a public or private water works, an engineer, chemist or other person qualified to aid or interested in the advancement of knowledge relative to water works.

An Honorary Member shall be a person of acknowledged eminence in some branch of water supply or of engineering.

A Junior shall be not less than eighteen years nor more than twenty-five years of age, a student or connected with water supply work.

An Associate shall be either a person, firm or corporation engaged in manufacturing or furnishing materials or supplies for the construction or maintenance of water works.

A Corporate Member shall be either a Water Board, Commission, Company or Municipal Corporation.

The initiation fees and annual dues are as follows:

	Initiation Fees	*Annual Dues*
Members	$ 3.00	$ 9.00
Juniors	1.00	3.00
Associates	10.00	25.00
Corporate Members	10.00	10.00

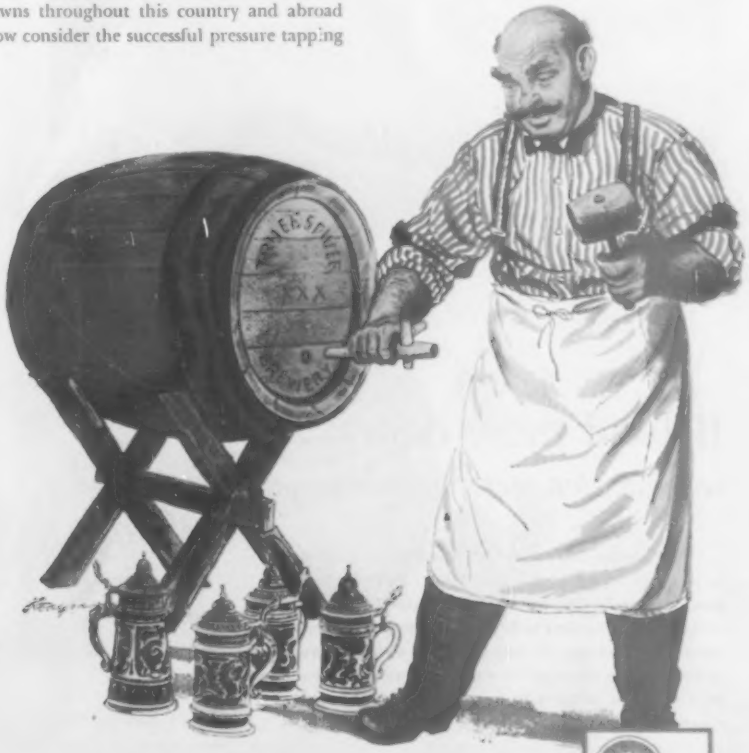
This Association has at least eight regular meetings each year, of which five are held in Boston, one in northern New England, one in southern New England, and one, the annual convention, held in September or October on such date as the Executive Committee may designate.

WHEN TAPPING WAS AN ART

Gone are the days when it took an unerring eye and a mighty wallop to tap a keg of beer. Gone, too, are the days when tapping concrete pipe under pressure was a complex, difficult operation.

Thanks to today's modern equipment, tapping LOCK JOINT CONCRETE PIPE under pressure has been reduced to a quick and easy process. Maintenance crews in hundreds of towns throughout this country and abroad now consider the successful pressure tapping of LOCK JOINT CONCRETE PIPE to be a normal part of the daily routine.

Upon request, we would be glad to send you our brochure covering the few simple steps required either for making service connections or for making larger taps.



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Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Mo.

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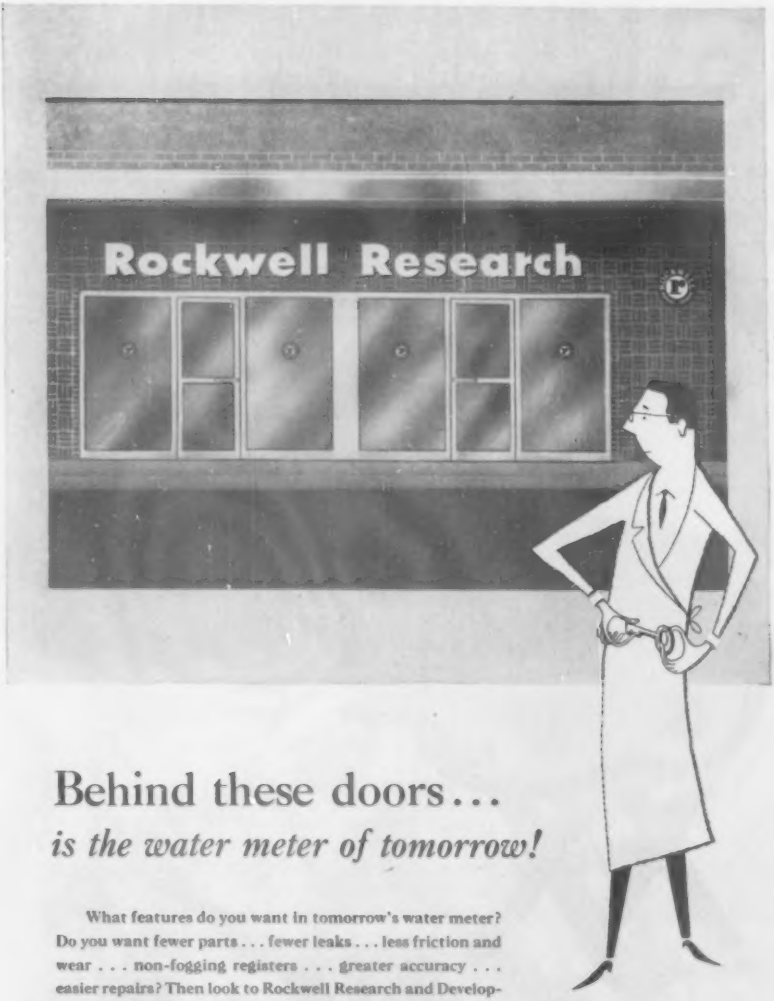

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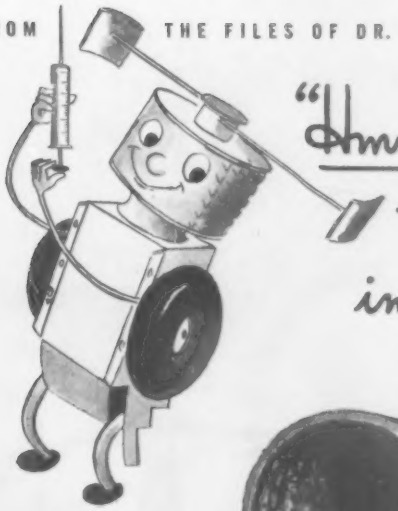
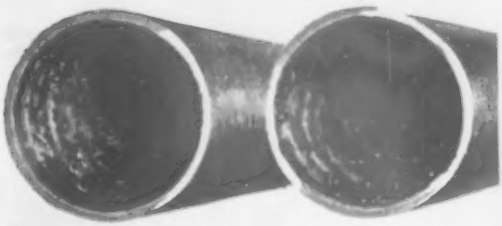
FROM THE FILES OF DR. CENTRILINE...



"Hmmm-Leakage! This calls for immediate consultation"



CASE #1687

PATIENT: 5 miles of 62" and 36" steel water mains in St. Louis, Missouri.

SYMPTOMS: Leakage repair costs on the increase from 1936 to 1947.

DIAGNOSIS: External corrosion causing pitting through the pipe wall.

TREATMENT: In 1947, after consultation with Centriline, pipelines were cleaned and cement-lined in place with a smooth, dense mortar lining by the Centriline Process.

RESULTS: The dense cement lining stopped leakage, eliminating high maintenance costs. Savings represented 13% return on the cost of cleaning and lining.*

This lining has paid for itself in only 8 years. Not only was the leakage stopped but the carrying capacity was increased. If your problem is leakage in steel pipe . . . or capacity reducing tuberculation in steel or cast iron water mains, consider the advantages of cement lining in place.

*From a paper written by Mr. John B. Dean, Division Engineer, Water Div., St. Louis, Mo.

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"There are mountains in Attica which can now keep nothing . . . but which were clothed, not so very long ago, with fine trees producing timber . . . while the country produced boundless pasture for cattle . . ."

As early as 300 B.C., when Plato thus lamented a tragedy of exhausted natural resources, there was little left of Attica's fertility — only insects crawling about the *"sites of extinct water supplies."* A lesson 2000 years old, to be heeded if we would escape the fate of Attica.

And the first logical step in vital water conservation is to replace flat, waste-conducive rates with Badger Metering.

The demand for water is at its peak in our history. All classes of users compete for more and *more*. A 75% increase in consumption is expected by 1975. In some areas the situation is already critical.

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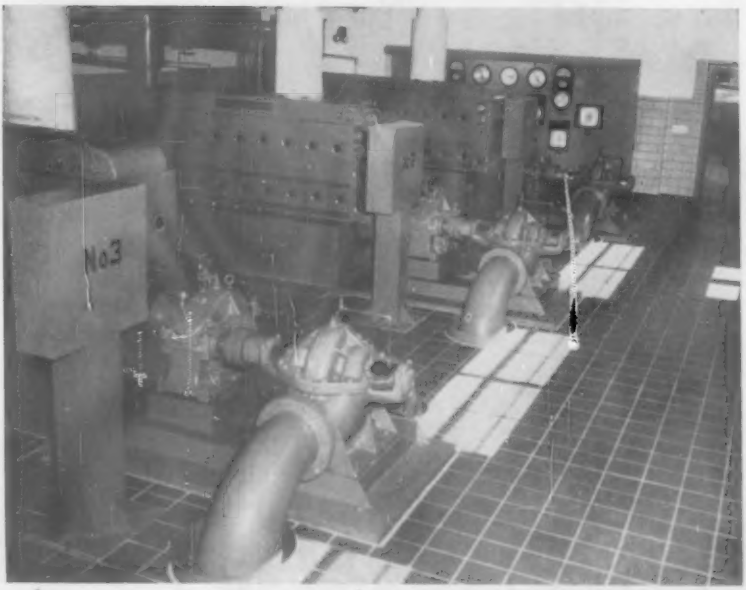

F-M Equipment at the New M.D.C. Newton Street Pumping Station, Brookline

The three Fairbanks, Morse Diesel Engine Driven Pumps pictured above are capable of delivering 4.10 Mgd under present operating conditions into the system of the M.D.C. and the town of Brookline.

Under future conditions, following completion of the Commission's proposed water system lines, the pumps will deliver water at the rate of 5.10 Mgd into the M.D.C.'s Southern Extra-High service lines and into the Bellevue Hill Reservoir.

The design and supervision of this new station for the Water Division of the Metropolitan District Commission was by Coffin & Richardson, consulting engineers of Boston.

The 10″ x 12″ Fairbanks, Morse Figure 5813 Pumps are each driven by a Fairbanks, Morse Model 31A6¼ Diesel Engine.

A trained Fairbanks, Morse Engineer is on hand to help solve YOUR pumping problems.

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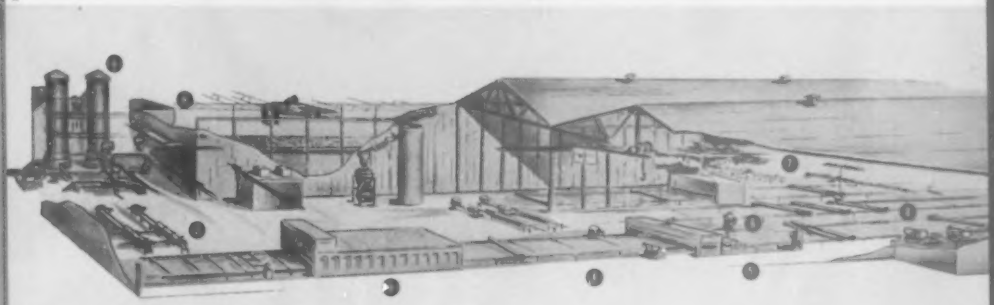
with our new, ultra-modern WARREN-SPUN pipe shop in Phillipsburg, N. J.



1. CUPOLAS
2. PIPE SPINNERS
3. ANNEALING FURNACE
4. GRINDERS
5. TAR DIP TANK
6. HYDRAULIC TESTERS
7. CEMENT LINING MACHINE
8. MECHANICAL JOINT DRILLS
9. MATERIAL STORAGE

100 years ago—WARREN was founded in Phillipsburg, New Jersey, dedicated to manufacturing a *quality cast iron pipe* for transfer of water to a growing nation. For the next 75 years pit-cast pipe in all sizes and in 12-foot laying length served as the industry standard. In fact, even in this atomic age, pit-cast pipe has no peer in larger sizes up to 84" in diameter.

Today—to meet the even greater demand of our rapidly expanding nation, WARREN manufactures in Everett, Massachusetts, *modernized* cast iron pipe, centrifugally cast in sand-lined molds. Also, currently operating in Phillipsburg, N. J., is a new deLavaud pipe shop to produce cast iron pipe centrifugally-spun in metal molds in 18- and 20-foot lengths.

That 73 utilities are still using cast iron pipe installed over 100 years ago is proof of high quality and dependability of cast iron pipe.

MODERNIZED cast iron pipe, centrifugally cast, is stronger, tougher, more uniform in quality and therefore more efficient, making it the world's most dependable pipe.

Only Warren, in the United States, casts pressure pipe by the *pit-cast, sand-spun,* and *deLavaud* processes—thus assuring you the right pipe for your particular need.

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Founded 1856

In Our Second Century of FLOWING PROGRESS

CITY OF BROCKTON — SILVER LAKE STATION

Shown above are two 400 HP motor driven pumping sets each consisting of two single stage pumps in series with overhead cross-over piping. The unit design conditions are 4500 G.P.M. against 300 Ft. T.D.H. The firm of Hayden, Harding and Buchanan prepared the plans and specifications and supervised the installation of all the equipment.

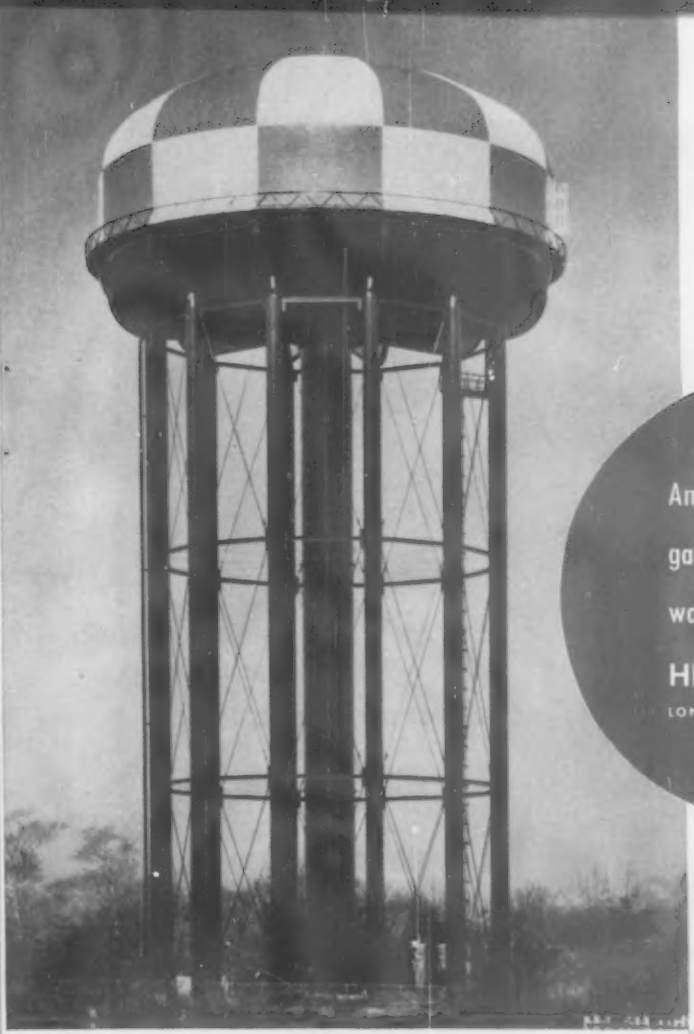
TURBINE EQUIPMENT COMPANY OF NEW ENGLAND

80 Federal Street **Phone LIberty 2-5993** **Boston 10, Mass.**

New England Representatives for

DE LAVAL STEAM TURBINE COMPANY

TRENTON, NEW JERSEY



Another 1,500,000 gallons of "certain-sure" water service for

HEMPSTEAD

LONG ISLAND, N.Y.

1951

Elevated Steel Tanks by

PITTSBURGH-DES MOINES

Latest of the many PDM Elevated Steel Tanks towering over Long Island's level terrain is this 1,500,000-gallon Radial Cone installation for Hempstead. 88 ft in diameter, the tank has a headrange of 35 ft and is on a tower 135 ft to bottom of capacity. Shown at right is an earlier million-gallon PDM tank of the same design, built for Hempstead in 1951.

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4—FLOODING.

The Smith Protectop Hydrant is designed to permit rapid return to service at minimum cost when a Hydrant is damaged as a result of a traffic accident.

The Protectop Hydrant Standpipe and Valve Stem are equipped with Special Couplings located just above the ground. The Couplings withstand operating pressures and ordinary impact with an ample factor of safety. Under excessive impact occasioned by traffic accidents the Couplings fracture at the design points thus minimizing the damage and permitting speedy return to service at low cost.

All Smith Hydrants are equipped with Compression Type Valves which definitely eliminate flooding since the line pressure holds the Valve against its seat in the closed position.

Write for details.

38

FIRE HYDRANTS · VALVES · SINCE 1896

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THE NATION'S No. 1 SOURCE

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LONG LIFE and DEPENDABILITY are built in. Ludlow Valves are fully bronze mounted. The two piece wedging mechanism is simple and rugged. The double disc parallel seat construction results in a wiping action that cleans the seats during the closing operation. The stems are special high tensile strength Ludlow manganese bronze with precision cut modified acme threads.

"NO POSSIBLE DIFFERENCE IN FIRST COST CAN OVERBALANCE THE PERPETUAL ECONOMY OF QUALITY."

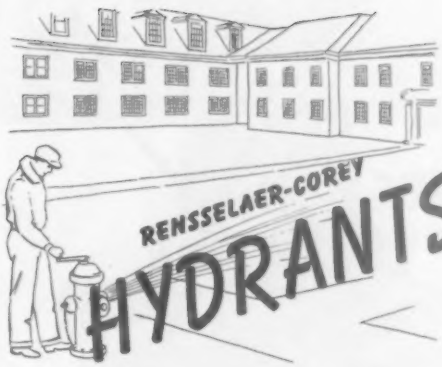
17

Ask for Bulletin 547W

THE LUDLOW VALVE MFG. CO., INC. TROY, N.Y.

TRADE LUDLOW MARK

GATE VALVES • FIRE HYDRANTS • SQUARE BOTTOM VALVES
CHECK VALVES • TAPPING SLEEVES • AIR RELEASE-VALVES

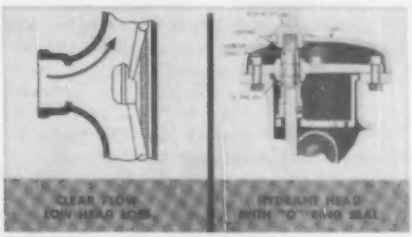


This is the hydrant that has been the standard of excellence in hundreds of cities for many years. Inspectors, maintenance men and fire chiefs, all have their reasons for endorsing the Rensselaer Corey Hydrant.

The illustrations show the clear-flow design which insures low head loss and maximum flow. Maintenance men like the simplicity of design and the speed of removing, inspecting and replacing the working parts as a single unit.

This hydrant opens with the pressure, is easy to operate and cannot stick. No digging for repairs, or for standpipe breakage. Now available with any type connection and "O" Ring seal.

18



Ask for Bulletin "G"

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DIVISION OF
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MANUFACTURING CO., INC.

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CHECK VALVES • TAPPING SLEEVES • AIR RELEASE VALVES

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For more than 50 years, Neptune has built fine meters designed to earn more and cost less. Many 50-year-old Tridents are still in service . . . perhaps in your own community . . . living proof that the Tridents you buy today will be a credit to your water system for many long years to come.

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Volumetric and Gravimetric Feeders for Dry and Fluid Materials.

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PROVIDENCE, RHODE ISLAND

Table of Contents

Proceedings: PAGE

Seventy-Fifth Annual Convention 349
Award of the Dexter Brackett Memorial Medal 352
Commemorative Award 353
Presidential Address by Allan F. McAlary 355
Report of the Tellers of Election 357
Annual Report of the Secretary 359
Annual Report of the Treasurer 363
Annual Report of the Editor 367
Report of Membership Committee 370
Annual Report of the Finance Committee 372
Report of the Committee on Committees 375
Annual Report of the Committee on Legislation 377
Report of Committee on Reciprocal Relations with the Institution of Water Engineers (London) 381
Report of Library Committee 382
Report of Committee for Survey of Ground-Water Supplies in New England 383
Massachusetts Public Ground-Water Supplies 386
Report of Committee on Specifications for Cast-Iron Pipe and Fittings 422
Report of Committee on Code for Pressure Piping 423
Progress Report of Committee on Laying Cast-Iron Water Mains 424
Report of the Committee on Specifications for Steel Pipe 426
Report of Committee on Standardization of Pipe Flanges and Fittings 427
Report of Committee on Conservation, Development and Utilization of Water Resources 428
Report of Committee on Methods of Financing Water Main Extensions 432
Progress Report of Committee on Recreational Use of Public Water Supplies 433
Committees of the New England Water Works Association 436
Memoir of Stephen H. Taylor 439
Memoir of Sir William Paterson 440

New England Water Works Association

ORGANIZED 1882

VOL. LXX DECEMBER, 1956 NO. 4

This Association, as a body, is not responsible for the statements or opinions of any individual

PROCEEDINGS

SEVENTY-FIFTH ANNUAL CONVENTION

BRETTON WOODS, N. H.

SEPTEMBER 17-19, 1956

The Seventy-Fifth Annual Convention of the New England Water Works Association was held at the Mount Washington Hotel, Bretton Woods, N. H., on September 17, 18 and 19, 1956.

MONDAY, SEPTEMBER 17

Morning Session

President Allan F. McAlary in the Chair.

The Annual Reports of the Secretary, Treasurer, Editor, Committee on Membership, Finance Committee, Committee on Committees, Committee on Legislation, Committee on Reciprocal Relations with the Institution of Water Engineers, and Library Committee were presented and accepted.

On motion duly made and seconded, it was VOTED that the action of the Executive Board in spending $107.12 in excess of the budget be ratified and confirmed.

The President declared the polls closed and appointed as tellers John J. Murphy, John H. Robinson and James L. Putnam.

The following reports of technical committees were presented and accepted: Committee for Survey of Ground-Water Supplies in New England, Committee on Specifications for Cast-Iron Pipe and Fittings, Committee on Laying Cast-Iron Water Mains, Committee on Specifications for Steel Pipe, Committee on Standardization of Pipe Flanges and Fittings, Committee on Conservation, Development and Utilization of Water Resources, Committee on Methods of Financing Water Main Extensions, Committee on Coefficients for Friction in

Pipe Lines, and the Committee on Recreational Use of Public Water Supplies. All formal reports are published in this issue of the JOURNAL.

Afternoon Session

Secretary Knox announced the election by the Executive Committee of the following new members: Bruce P. Eaton, Pipe Salesman, Johns Manville Sales Corp., Boston, Mass.; Frederick W. Merrill, Superintendent of Public Works, Amesbury, Mass.; Edmund J. Laubusch, Sanitary Engineer, The Chlorine Institute, Inc., New York, N. Y.; Herman H. Winter, Superintendent of Public Works, Monson, Mass.

Associate Member

R. N. Smith Supply Co., Lynn, Mass.

A paper on "St. Lawrence Power Project" was read by W. M. Hall, Vice-President, Charles T. Main, Inc., Boston, Mass.

A paper on "Three R's of Sanitary Engineering: Resources, Research and Results," was read by Harry A. Faber, Research Coordinator, Division of Sanitary Engineering Services, U.S. Public Health Service, Washington, D. C.

Evening

A real old-fashioned barn dance was held in the ballroom of the hotel, under the sponsorship of the Water and Sewage Works Manufacturers Association.

TUESDAY, SEPTEMBER 18

Morning Session

A paper on "Application and Usage of the Modern Vertical Pump" was read by D. T. Johnstone, Manager, Turbine and Propeller Pump Sales, Fairbanks, Morse & Co., Pomona, Cal.

A paper on "Application and Operation of the Submersible Motor and Pump" was read by John E. Hawks, Chief Engineer, Pomona Works, Fairbanks, Morse & Co., Pomona, Cal.

A paper on "Supervisory Control Systems" was presented by Russell H. Babcock and Robert E. Burrell, Engineers, The Foxboro Co., Foxborough, Mass.

WEDNESDAY, SEPTEMBER 19

Morning Session

A paper on "Current Specifications for Cast-Iron Pipe and How to Order to Specifications" was read by Thomas F. Wolfe, Managing Director, The Cast Iron Pipe Research Association, Chicago, Ill.

A paper on "The Water Supply of St. John's, Newfoundland," was read by Robert D. Mitchell, Partner, Malcolm Pirnie Engineers, New York, N. Y.

A paper on "Pressure and Volume Survey, Town of Arlington, Massachusetts," was read by Francis N. O'Hara, Superintendent of Public Works, Arlington, Mass.

Afternoon Session

A paper on "Use of Pipeline Network Analyzer at Philadelphia" was read by Victor A. Appleyard, Chief of Water Operations, Water Department, Philadelphia, Pa.

A paper on "Maintaining Pipeline Coefficients (C) after Water-Main Cleaning" was presented by William D. Monie, Chief Engineer, and Harold B. Scales, Chemist, Portland Water District, Portland, Me.

Evening

A social hour was held in the ballroom, followed by a banquet in the main dining-room, both functions with the compliments of the Water and Sewage Works Manufacturers Association.

AWARD OF THE DEXTER BRACKETT MEMORIAL MEDAL

PRESIDENT MCALARY. I shall now call on the Chairman of the Dexter Brackett Memorial Medal Committee, Mr. William H. McGuinness, who will present the medals and the Commemorative Award.

WILLIAM H. MCGUINNESS. The Dexter Brackett Memorial Medal award was established in 1916, to recognize the most meritorious paper published in the JOURNAL of the Association during the preceding year.

The Committee appointed for this year to select the papers and make the presentation consisted of I. Laird Newell, Harold J. Toole and myself. We are proud to announce that, in our judgment, the paper most worthy and entitled to the award was titled "Determination of Charges for Public Fire Protection," by Thomas R. Camp and Darrell A. Root, of Camp, Dresser & McKee, Boston; and it therefore gives me great pleasure to present the recipients with medals for 1955—Mr. Root and Mr. Camp.

DARRELL A. ROOT. Mr. Chairman, Mr. President, officers and members of the Association: Mr. Camp and I are certainly honored with the medals you have bestowed upon us, and are grateful for them. We thank you very much for them.

COMMEMORATIVE AWARD

WILLIAM H. MCGUINNESS. The Commemorative Award was established by the Association in memory of members who have been prominent in the several fields of the water-works profession. The purpose of the award is to give due recognition to the paper judged as next most meritorious to the one receiving the Dexter Brackett Memorial Medal.

The Memorial Medal Award for 1955 is made in memory of George C. Whipple. Professor Whipple was famous as a world-wide educator in public health and sanitary science. He was associated with the Boston and the New York Water Departments at the turn of the century, and he did pioneer work in studying microorganisms in drinking water. From 1911 until his death in 1924 he was Professor of Sanitary Engineering at Harvard University. His book on the microscopy of drinking water is an outstanding authority in the field. A member of the New England Water Works Association for over 31 years, he contributed many valuable papers.

It gives me great pleasure to present this Award to Richard S. Woodhull for his paper, entitled "Tastes and Odors in Connecticut Water Supplies." I regret that Mr. Woodhull is unable to be here this evening, due to a prior engagement, and I suggest that Fred Almquist, an associate of his in the State Department of Public Health of Connecticut, kindly accept the honor in his behalf.

FREDERICK O. A. ALMQUIST. Mr. Chairman, ladies and gentlemen: Mr. Woodhull asked that I express his appreciation to the Committee in the selection of his paper for this Award. He was naturally very much pleased to receive it and was sorry he was unable to be here in person. Thank you.

PRESIDENT MCALARY. Thank you. Now it is the privilege of your President to present the Twenty-Five-Year Certificates. These certificates are awarded annually by the Association in recognition of those members who have completed twenty-five years' service to their

municipalities and have been members of the Association for the same period of time.

The recipients this year are: first, Harry Manson, of Lebanon, N. H.

Next, John E. Landers, of East Hartford, Conn. It is our understanding that he is not present, and the Award will be accepted by George Watson.

Next, Joseph Landers, of Weymouth, Mass., who is one of the Water Commissioners, but who was unable to be here.

The next is Samuel F. Newkirk, Jr., of Elizabeth, N. J.

The constitution provides that on this occasion the President shall deliver an address, and for the next few minutes I shall endeavor to fulfill that pleasant duty.

PRESIDENTIAL ADDRESS

By Allan F. McAlary

I do not want to weary you with a speech on how to run a waterworks association, or on what will happen if we do not do thus and so. I believe we are doing all right, or at least well enough. If I felt that we were not moving in the right direction, I should not hesitate to say so. So let's relax and consider for a few moments how we operate this Association, the object of which is to advance the knowledge of water works and supply, and to encourage professional and social intercourse.

The President wields the gavel, but he really doesn't run the show, although he is expected to exercise general supervision over its affairs. In other words, he should be alert as to what is going on. The sole management of the association is vested in the Executive Committee, subject, of course, to the constitution.

Let me tell you a few things about this Executive Committee. It consists of the President, the Vice-Presidents, the two immediate Past Presidents, three Directors, and the Treasurer. It meets, generally, every month in the year except July. All matters relating to the welfare of the Association, big or small, are given careful consideration at these meetings. Certain decisions have to be referred to the membership for approval, but the ordinary run of business is done by the Committee. This year the membership was asked to approve the increase in dues and to adopt the scholarship program.

Sitting with the Executive Committee is the Executive Secretary, without whom we could scarcely function. Our good fortune in having Joseph C. Knox and his able helper, Mrs. Melrose, to look after the countless details relating to the operation of this Association has been recognized by my predecessors in this office, and I now express my own appreciation and that of my associates for the help they have been to us in the past year.

Now let's think about the meetings of the membership and how valuable they are to us. Have you ever stopped to think of how

much goes on at one of the monthly winter meetings in Boston? So much goes on that one person cannot take it all in. First, there is a water-works school, conducted by an eminent teacher, followed by a Superintendents' forum and a Chemists' session, running concurrently. About this time the Executive Committee goes into a huddle, and often other committees get together. After a short breathing spell a good luncheon is enjoyed.

The technical program is the final phase of a busy day. It is here that good papers are read, to be found later in our JOURNAL. The Editor of the JOURNAL is George C. Houser, to whom we are indebted for a job well done.

The April meeting is held somewhere in southern New England, and the May meeting in a northern section. These two meetings add variety to the general program, by allowing us to see what is being done in water works in one locality after another. Recreational features dominate the June Conference, although some business is done at this meeting.

Our programs culminate in the Annual Convention, where one finds both work and play for all.

Now all these things don't just happen. The programs have to be arranged, often with much effort. The large attendance at our meetings during the past year is evidence that the programs were well planned by our veteran chairman, Kenneth Knowlton, and his able associates. The diversified nature of the programs gives a wonderful chance for member participation—for the superintendent, the engineer, the manufacturer, and the salesman.

The participation of the Manufacturers' Association in our activities contributes much to our accomplishments, and the efforts of that group are appreciated.

The ensuing year, especially, is to be one that will call for the co-operation of all of us. At the 1957 convention, to be held at the Statler in Boston, we shall celebrate our 75th anniversary as an association. We must make that occasion one long to be remembered. There is a lot of work to be done. There will be many committees needed to handle the various phases of this celebration. Please, each one of you, be ready to help when you are asked.

In a few moments we shall have a new President, but first I want to tell you that the past year has been a rewarding one for me.

I thank you, one and all, for your generous co-operation and for the many things you have done to make my term of office so pleasant.

* * * * *

PRESIDENT MCALARY. I shall now call upon Chairman John J. Murphy for the report of the Tellers of the Election.

REPORT OF THE TELLERS OF ELECTION

FOR PRESIDENT:	Edward L. Tracy	382 votes—10 blanks
FOR VICE-PRESIDENT:	Clarence L. Ahlgren	385 votes— 7 blanks
FOR DIRECTOR:	Kenneth W. Robie	384 votes— 8 blanks
FOR DIRECTOR:	Peter C. Karalekas	384 votes— 8 blanks
FOR TREASURER:	William P. Melley	387 votes— 5 blanks

Respectfully submitted,

(*Signed*) JOHN J. MURPHY, *Chairman*
JOHN H. ROBINSON
JAMES T. PUTNAM

PRESIDENT MCALARY. I now declare the officers as read duly elected.

It is now my pleasure to give you your new President, Edward L. Tracy.

PRESIDENT EDWARD L. TRACY. To you members of the New England Water Works Association, I say thanks for your expression of confidence in me and for the great honor you have just bestowed upon me. I realize now that you have to be actually standing in this spot to appreciate the responsibility of this presidency. I realize now what it is like to think of following the long line of presidents who have built up such a wonderful reputation and tradition for this Association.

The comforting thought right now is that they all had the help of the members of the Association, the water-works officials, the engineers, the manufacturers' representatives, supply and materials men, and your co-operation has helped all of them in their turn.

So that I, looking forward to this coming year, shall be thinking of that co-operation and knowing that it will continue and that, as President McAlary said, it is going to be a very wonderful and out-

standing year, starting in November at the Statler Hotel with the regular meetings, and in the winter and spring, and ending up with, of course, the greatest meeting we have ever experienced, the 75th Anniversary. Many of you, as President McAlary said, will be called on, and we know that you will help as you always have.

It is not very long ago that somebody invented a job for the incoming president. Up until then all he had to do was to say "Thank you" and sit down. But now it is my pleasure to present to retiring president Allan McAlary a certificate of his year of presidency.

MR. MCALARY. Thank you very much.

PRESIDENT TRACY. The next official act—which I know you are all waiting for at the moment—is to declare the convention, which was opened by President McAlary on Monday morning, now adjourned to the ballroom.

ANNUAL REPORT OF THE SECRETARY

August 31, 1956

Mr. President and Members of the New England Water Works Association:

The Secretary herewith submits the following report of the changes in the membership during the past fiscal year, and the general condition of the Association.

The present membership is 1,115, constituted as follows: 11 Honorary Members, 926 Members, 142 Associate Members and 36 Corporate Members.

MEMBERSHIP

				Total
Sept. 1, 1955—Honorary Members		14		
Withdrawals:				
Died	3	3		11
Members, Total		906		
Withdrawals:				
Died	23			
Dropped	11			
Resigned	23	57	849	
Elected:				
September 18, 1955	4			
October 21, 1955	7			
November 17, 1955	8			
December 15, 1955	6			
January 19, 1956	4			
February 16, 1956	7			
March 15, 1956	9			
April 19, 1956	15			
May 17, 1956	5			
August 17, 1956	13		78	927

Sept. 1, 1955—Associates, Total		138		
Withdrawals:				
Dropped	1			
Resigned	6	7	131	
Elected:				
September 18, 1955	1			
October 21, 1955	1			
December 15, 1955	1			
February 16, 1956	3			
March 15, 1956	1			
April 19, 1956	1			
May 17, 1956	2			
August 17, 1956	2		12	143
Sept. 1, 1955—Corporates, Total		37		
Withdrawals:				
Resigned	2	2	35	
Elected:				
September 18, 1955	1		1	36
September 1, 1956—Total Membership				1,117
September 1, 1955—Total Membership				1,095
Gain of				22

ELECTIONS

Members

September 18, 1955—Jamil A. Nasir, Walter A. Norrington, Vernon L. Packard, Irving B. Smith. (4)

October 21, 1955—Kenneth E. Bender, Thomas G. Braman, Harold O. Congdon, Gilbert U. Gustafson, Donald W. Lavalette, Tracy B. Lord, Sydney R. Stapley. (7)

November 17, 1955—John K. Carr, Joseph M. Hackett, Matthew E. Kearns, Richard F. Mason, Paul C. Ross, Robert Veo, William G. Wilkie (7). Hugo Perez La Salvia, re-instated (1).

December 15, 1955—John B. Donohoe, Edward H. Haley, George H. Hill, Gerald H. Lamprey, Karl H. Schamberger, Chester R. Spinney. (6)

January 19, 1956—Howard W. Anderson, H. Russell Medding, Jr., William D. Monie, Ernest J. Sullivan. (4)

February 16, 1956—Thomas E. Duff, Willard L. Gage, William R. Godfrey, Wilfred H. Goodridge, Joan Goostray, James J. McCarthy, John P. Sullivan. (7)

March 15, 1956—J. Edward Bamber, Cecil A. Bissionnette, Walter F. Burdick, Kenneth R. Couch, Lester M. Klashman, Baxter Robertson, E. Locke Robinson, Robert H. Varney, Walter A. Ware. (9)

April 19, 1956—Theodore L. Cate, Wallace C. Darsch, Joseph K. Fairbanks, Stephen J. Gannon, Robert F. Kelsey, Frank P. McNea, Joe A. Morrison, Michael R. Rossi, Ira M. Sanborn, Frank Soracco, Whitney K. Stearns, Nat S. Stevens, Arthur E. Sullivan, Arthur I. Winsor (14). Peter T. Peterson, re-instated (1).

May 17, 1956—Victor N. Bengle, John A. MacKenzie, Frank Reid, Jr., George P. Richardson, John G. W. Thomas. (5)

August 17, 1956—Mario M. Boschetti, Albert F. Brown, William M. Conron, William C. Fray, Roderic A. Gardner, Richard J. Gayer, John A. Hawthorne, Charles W. Horsfall, Edwin L. Marsden, J. Gilbert Miller, Herbert Rollinson, Francis E. Valentine, Henry R. Wheeler, Jr. (13)

Associate Members

September 18, 1955—Glenfield & Kennedy, Inc. (1)

October 21, 1955—Kimball-Jones Company (1)

December 15, 1955—Walworth Company (1)

February 16, 1956—Connecticut Chlorine Products, Inc., Mogan-Walker Company, New England Pump & Machinery Company. (3)

March 15, 1956—Warren Steam Pump Company (1)

April 19, 1956—Pittsburgh Tank & Tower Company (1)

May 17, 1956—Hammarlund Manufacturing Company, Inc., and Rumford Chemical Works. (2)

August 17, 1956—F. S. Brainard & Company and National Gunite Corporation. (2)

Corporate Members

September 18, 1956—West Bridgewater Water Commission (1)

WITHDRAWALS

Members

Died: J. Walter Ackerman, Samuel J. Bargh, Henry F. Beal, Theodore L. Bristol, Frederick W. Cotter, Thomas F. Culliney, Jasper W. Everett, Harold L. Field, Harry U. Fuller, Frank W. Jones, Arthur C. King, Roger W. Macdonald, Joseph N. McKernan, Frank P. Morse, James A. Newlands, Sir William Paterson, William W. Peabody, Langdon Pearse, George L. Stebbins, Samuel O. Swartz, Stephen H. Taylor, George C. Wallace and Henry L. Weston. (23)

Resigned: Abner C. Bristol, Walter M. Campbell, Frank A. Chase, Charles O. Clark, Robert V. Cushman, Eugene A. Drumm, Frank E. Fahlquist, Ralph K. Goodwin, Arthur W. Harrington, Charles W. Harris, Virgil W. Langworthy, Edward R. Lawson, William H. Moody, E. B. Myott, Malcolm J. Quimby, Charles B. Perkins, Fred J. Reny, Charles G. Richardson, Frank A. Shaw,

Eugene F. Shyne, Hervey J. Skinner, Miner R. Stackpole and Joseph S. Strohmeyer. (23)

Dropped: William T. Barry, William Doubleday, Ezra S. Johnson, John K. Kirn, Francis J. McLaughlin, Addison P. Munroe, Rostislaff Nebolsine, Joseph J. Shepherd, John B. Van Why, Albert J. Wall and Leslie M. Willard. (11)

Associates

Resigned: Curry Oil Company, Electro Rust-Proofing Company, Engineering News Record, Infilco, Inc., Pittsburgh Pipe Cleaner Company and Proportioneers, Inc. (6)

Dropped: Albert Pipe Supply Company. (1)

Corporates

Resigned: Falmouth Water Department and Laconia Water Company. (2)

RECEIPTS FOR THE FISCAL YEAR SEPTEMBER 1, 1955, TO AUGUST 31, 1956

Entrance fees	$ 271.00
Dues, members of all grades	9,980.00
Dividends	484.48
Advertising	5,774.75
Subscriptions	671.38
Journals	26.66
Membership certificates	64.50
Membership lists	22.50
	$17,295.27

There is due the Association:

Dues	$ 113.00
Advertising	40.00
	$ 153.00

Respectfully submitted,

(*Signed*) JOSEPH C. KNOX, *Secretary*

ANNUAL REPORT OF THE TREASURER

Boston, September 10, 1956

To William P. Melley, Treasurer,
New England Water Works Association,
Boston, Massachusetts.

We have examined the statement of assets and funds and the statement of cash receipts and disbursements of the general fund of the New England Water Works Association for the year ended August 31, 1956. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

We traced all recorded receipts into the depositary bank, verified the general fund bank account and petty cash fund as at August 31, 1956, and examined properly approved vouchers for all disbursements. On September 7, 1956, we examined the paid-up cooperative bank shares at the First National Bank of Boston, and we verified by direct communication the cash on deposit in savings banks.

In our opinion, the accompanying statement of assets and funds and the note thereon and the related statement of cash receipts and disbursements of the general fund present fairly the financial position of the New England Water Works Association at August 31, 1956, and the recorded cash receipts and disbursements for the year then ended, on a cash basis consistent with that of the preceding year.

(*Signed*) SCOVELL, WELLINGTON & COMPANY

STATEMENT OF ASSETS AND FUNDS (Exhibit A)

As at August 31, 1956

Assets

Invested funds assets			
Cash in savings banks			
Boston Five Cents Savings Bank	$ 5,202.63		
Provident Institution for Savings	5,242.32	$10,444.95	
Securities			
Braintree Co-operative Bank, 10 paid-up shares	$ 2,000.00		
Sandwich Co-operative Bank, 10 paid-up shares	2,000.00	4,000.00	$14,444.95
General fund assets			
Cash, First National Bank of Boston		$ 5,386.33	
In office		50.00	
		$ 5,436.33	
Furniture and fixtures		1,180.00	6,616.33
			$21,061.28

Funds

Invested funds			$14,444.95
General fund			
Balance, August 31, 1955		$ 5,125.56	
Add Transfers from invested funds			
Sale of Milton Co-operative Bank shares	$1,000.00		
Sale of Stoneham Co-operative Bank shares	2,000.00	3,000.00	
		$ 8,125.56	
Excess of disbursements over receipts, Exhibit B		(1,509.23)	
Balance, August 31, 1956			6,616.23
			$21,061.28

Note: The statement above, prepared on a cash basis, includes dues received in advance, $6,999, and employees' withholding tax, $143.95. It does not reflect the following:

Accounts receivable, dues	$113
Due on account of advertising	40
	$153

No depreciation has been taken on furniture and fixtures.

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS (Exhibit B)

GENERAL FUND

For the year ended August 31, 1956

Receipts (exclusive of dues received in advance and employees' withholding tax)			
Initiation fees		$ 271.00	
Dues, 1955-1956 and prior years		2,981.00	
Interest		484.48	
From publication of Journal			
Advertisements	$ 5,774.75		
Subscriptions	671.38		
Sale of Journal	26.66	6,472.79	
Miscellaneous			
Membership certificates	$ 64.50		
Membership lists	22.50	87.00	
Total receipts			$10,296.27
Disbursements			
Publication of Journal			
Printing	$5,611.74		
Reprints	170.01		
Reporting	235.60		
Stationery and postage	193.24		
Editor's salary	750.00		
Sundry	100.29	$ 7,060.88	
General and administrative			
Salaries	$ 4,910.00		
Certificates of membership	139.48		
Printing, postage and stationery	243.14		
Office supplies and expense	106.83		
Office rent	1,260.00		
Electricity	99.49		
Telephone and telegraph	310.59		
Auditing	85.00		
Social security taxes	165.85		
Steel shelvings	150.00		
Fidelity bonds	93.75		
Sundry	216.96	7,781.09	
Forward		$14,841.97	$10,296.27

Brought forward		$14,841.97	$10,296.27
Disbursements (continued)			
Meetings and committees			
Water works school	$ 125.00		
Printing, postage and stationery	1,281.73		
Convention expense	869.08		
Dinners	974.91		
Contribution to June conference	150.00		
Sundry	264.43	3,665.15	
Interest added to savings bank deposits		306.98	
Total disbursements			18,814.10
Excess of disbursements over receipts (exclusive of dues received in advance and employees' withholding tax for current year)			($ 8,517.83)
Dues received in advance		$ 6,999.00	
Employees' withholding tax			
Receipts for current year	$ 143.95		
Less Payment for prior year	134.35	9.60	7,008.60
Excess of disbursements over receipts, Exhibit A			($ 1,509.23)
Balance, general cash, August 31, 1955		$ 3,945.56	
Add Sale of Milton Co-operative Bank shares	$ 1,000.00		
Sale of Stoneham Co-operative Bank shares	2,000.00	3,000.00	6,945.56
Balance, general cash, August 31, 1956			
Represented by			
Cash in First National Bank of Boston		$ 5,386.33	
Cash in office		50.00	
			$ 5,436.33

ANNUAL REPORT OF THE EDITOR

To the New England Water Works Association:

The Editor submits herewith his report for the year ending August 31, 1956. The financial figures, tabulated in the report, are derived from the report of the Treasurer, which contains a detailed statement of the receipts and disbursements on account of the September and December, 1955, and March and June, 1956, issues of the JOURNAL.

In Table 1 is presented a statement of the material contained in the four issues of the JOURNAL for the past year, while in Table 2 is given a comparison of the JOURNAL for the past year with those for preceding years.

TABLE 1.—STATEMENT OF MATERIAL IN SEPTEMBER AND DECEMBER, 1955, AND MARCH AND JUNE, 1956, ISSUES OF THE JOURNAL OF THE NEW ENGLAND WATER WORKS ASSOCIATION

	Number of pages								
	Papers	Proceedings*	Total text	Index	Advertisements	Cover and contents	Insert plates	Total pages	Total cuts (number)
Sept., 1955	116	4	120	0	47	4	0	171	29
Dec., 1955	0	104	104	10	46	4	0	164	6
Mar., 1956	89	20	109	0	49	4	3	165	32
June, 1956	101	23	124	0	45	4	1	174	27
Total	306	151	457	10	187	16	4	674	94

* Including standard specifications.

Size. The four issues contained 674 pages, of which 457 were text.

Cost. The gross cost of the JOURNAL was $7,060.88, equivalent to $6.38 per member; the net cost was $588.09, equivalent to $.53 per member.

Reprints. Reprints of papers have been furnished to authors at cost.

TABLE 2.—COMPARISON OF JOURNALS OF THE NEW ENGLAND WATER WORKS ASSOCIATION
Four Issues for Fiscal Year Ending August 31

	1947	1948[1]	1949[2]	1950[3]	1951[4]	1952[5]	1953[6]	1954[7]	1955[8]	1956[9]
Average edition (copies printed)	1,275	1,350	1,325	1,250	1,300	1,390	1,420	1,442	1,476	1,495
Average membership	846	876	905	921	957	1,017	1,057	1,077	1,089	1,106
Circulation at end of year	1,083	1,129	1,164	1,172	1,240	1,283	1,331	1,334	1,357	1,387
Pages of text	428	411	452	440	423	463	421	436	442	457
Pages of text per 1,000 members	516	469	500	477	442	456	398	405	406	413
Total pages, all kinds	632	615	661	666	703	671	635	652	655	674
Total pages per 1,000 members	747	702	731	723	734	660	601	606	602	610
Gross Cost:										
Total	$4,193.60	$4,239.64	$5,016.44	$5,240.51	$6,069.62	$5,423.98	$5,865.67	$6,108.76	$5,898.97	$7,060.88
Per copy	0.82	0.78	0.95	1.05	1.17	0.98	1.03	1.06	1.00	1.18
Per page	6.63	6.90	7.60	7.86	8.64	8.08	9.23	9.37	9.02	10.48
Per member	4.96	4.84	5.55	5.69	6.34	5.34	5.55	5.68	5.42	6.38
Per member per 1,000 pages	7.85	7.87	8.40	8.55	9.02	7.96	8.75	8.71	8.28	9.46
Per member per 1,000 pages of text	11.58	11.78	12.28	12.92	14.99	11.52	13.19	13.03	12.25	13.92
Surplus:										
Total	$ 913.91	$1,990.81	$1,058.96	$1,294.73	$ 351.34	$1,040.76	$ 500.97	$ 513.89	$ 101.11	$ 588.09*
Per copy	0.18	0.37	0.20	0.26	0.07	0.19	0.09	0.09	0.02	0.10*
Per page	1.44	3.32	1.60	1.94	0.50	1.55	0.79	0.79	0.15	0.87*
Per member	1.08	2.28	1.17	1.41	0.37	1.02	0.47	0.48	0.09	0.53*
Per member per 1,000 pages	1.71	3.71	1.77	2.12	0.53	1.52	0.74	0.73	0.14	0.79*
Per member per 1,000 pages of text	2.52	5.55	2.59	3.20	0.88	2.20	1.12	1.10	0.20	1.16*

* Net cost.

1 Including 54 pages of standard specifications.

2 Including 107 pages of standard specifications and recommended practice.

3 Including 25 pages of standard specifications.

4 Including comprehensive index, 1882 to 1950.

5 Including 16 pages of standard specifications.

6 Including 87 pages of standard specifications and recommended practice.

7 Including 71 pages of standard specifications and recommended practice.

8 Including 8 pages of standard specifications.

9 Including 27 pages of standard specifications.

Circulation. The present circulation of the JOURNAL is:

Members, all grades	1,117
Subscribers	177
Exchanges	25
Advertisers	68
Total	1,387

JOURNALS have been sent to all subscribers and to advertisers.

Respectfully submitted,

(*Signed*) GEORGE C. HOUSER, *Editor*

REPORT OF MEMBERSHIP COMMITTEE

September 17, 1956

To the New England Water Works Association:

During the past year ninety-one (91) have been elected to membership in the Association with six (6) applications pending, and assuming the six applications are acted upon favorably at the September meeting, the membership will stand at 1,123.

The following is a summary of additions and losses for the year ending September 1, 1956:

Membership, August 31, 1955		1,095
Losses:		
Members resigned	23	
Associates resigned	2	
Corporates resigned	6	
Members died	26	
Members dropped	11	
Associates dropped	1	69
New Members:		
Members	78	
Corporates	1	
Associates	12	91
Net gain for the year		22
Total, September 1, 1956		1,117
Applications pending		6

The several members of the Committee have been most coopera-

tive in furnishing lists of prospective members, and their assistance is appreciated by the Chairman.

Respectfully submitted,

(*Signed*) GEORGE W. COFFIN, *Chairman*
JOHN J. BAFFA
ROLAND F. BURKE
EDWIN T. MCDOWELL
CLARENCE W. METCALF
FRED P. STRADLING
RICHARD S. WOODHULL

ANNUAL REPORT OF THE FINANCE COMMITTEE

August 31, 1956

To the Executive Committee of the
New England Water Works Association:

The Finance Committee herewith submits its report on the budget for the year 1955-56, and its recommended budget for the year 1956-57.

The Committee has examined the figures obtained from the records of the Association during the past year, and has consulted with the Treasurer with reference to probable revenue and disbursements for the coming year.

The following changes have taken place in the membership:

	Resigned	Died	Dropped	Elected	Loss	Gain
Members	23	26	11	78		18
Corporates	2			1	1	
Associates	6		1	12		5
	31	26	12	91	1	23

The following tabulation is the estimated and actual budget for the past year:

REVENUE FOR 1955-56

	Budget	Actual
Initiation fees	$ 200.00	$ 271.00
Dues	8,000.00	9,980.00
Interest	300.00	484.48
Advertising	6,000.00	$5,774.75
Other Journal receipts	700.00	698.04
Miscellaneous	50.00	87.00
	$15,250.00	$17,295.27

DISBURSEMENTS FOR 1955-56

	Budget	Actual
General and Administrative	$ 7,500.00	$ 7,781.09
Journal	6,200.00	7,060.88
Meetings and Committees	3,000.00	2,690.24
Net expense of luncheons	900.00	974.91
Contingencies	800.00	
	$18,400.00	$18,507.12

The estimated deficit for the past year was $3,150.00, while the actual deficit amounted to only $1,211.85 because of the increased dues received during the year for 1956-57.

Regardless of the many economies effected during the year, operating expenses have continued to increase. In addition to a general over-all increase in costs, printing expenses have increased particularly and a substantial increase in the cost of publishing the JOURNAL becomes effective with the next issue. Under the circumstances the following budget recommended for 1956-57 shows a deficit of $3,200.00. It should be noted that this includes the non-recurring $1,000.00 contribution of the Association to the Scholarship Fund.

BUDGET FOR THE YEAR 1956-1957—REVENUE

Initiation fees	$ 200.00
Dues	10,700.00
Interest and dividends	350.00
Journal advertising	5,600.00
Other Journal receipts	700.00
Miscellaneous	50.00
	$17,600.00

BUDGET FOR THE YEAR 1956-1957—DISBURSEMENTS

General and Administrative	$ 7,800.00
Journal	7,600.00
Meetings and Committees	2,600.00
Net expense of luncheons	1,000.00
Contribution to Scholarship Fund	1,000.00
Contingencies	800.00
	$20,800.00

As the invested funds of the Association now total only $14,000.00, continued deficit budgets will materially reduce this amount. Careful study has been made of possible ways and means of increasing the revenue, but the only practical solution appears to be a further increase in dues.

It is therefore recommended that consideration be given to increasing the dues for 1957-58 sufficiently to meet the operating expenses.

We refer you to the Treasurer's report for further financial details, and to the Secretary's report for changes in the membership listing.

Respectfully submitted,

(*Signed*) THOMAS S. LAWRENCE, *Chairman*
JAMES D. HALWARTZ
GEORGE N. WATSON

REPORT OF THE COMMITTEE ON COMMITTEES
1955 - 1956

To the New England Water Works Association:

The Committee on Committees is composed of the members of the Executive Committee in order to promote closer relationship with the various technical committees of the Association. The Committee on Committees co-ordinates the programs of the technical committees and reviews their annual progress.

The Committee on Committees has carefully considered the work of the committees during the past year, and recommends the continuation of all the present committees as follows:

N.E.W.W.A.

8. Committee on Legislation
9. Committee on Reciprocal Relations with the Institution of Water Engineers (London)
11. Committee on Survey of Ground Water Supplies in New England
12. Committee on Rainfall and Yield of Drainage Areas
16. Committee on Coefficients for Friction in Pipe Lines
19. Committee on Water Quality and Treatment
21. Committee on Specifications for Cast Iron Pipe and Fittings
22. Committee on Reinforced Concrete Pressure Pipe
23. Committee on Code for Pressure Piping
24. Committee on Laying Cast-Iron Pipe
25. Committee on Specifications for Steel Pipe
26. Committee on Standardization of Pipe Flanges and Fittings
28. Committee on Steel Standpipes and Elevated Tanks
30. Committee on Meter Specifications
37. Committee on Federal Activities

38. Committee on Fluid Permeability
39. Committee on Deep-Well Vertical Pumps
42. Committee on Conservation, Development and Utilization of Water Resources
44. Committee on Publicity
45. Committee on Recreational Uses of Public Water Supplies
46. Committee on Plastic Pipes and Plastic Linings for Water Supply Uses
47. Committee on Methods of Financing Water Main Extensions

The Committee on Committees appreciates the efforts of the technical committees in fufilling their assignments. The work of these committees constitutes one of the most important activities of the Association in advancing the knowledge relating to water-works design, construction and management. Any suggestions for the establishment of new committees on subjects of importance to the water-works profession should be submitted to the Committee on Committees.

Respectfully submitted,

COMMITTEE ON COMMITTEES

ANNUAL REPORT OF THE COMMITTEE ON LEGISLATION

September 17, 1956

To the New England Water Works Association:

Your Legislative Committee submits herewith its report on activities in the Legislatures of the New England states during the year 1956.

Sessions were held in only two states—*i.e.*, Massachusetts and Rhode Island—and your committee member from each submitted one or more enactments deemed worthy of inclusion in this report.

In *Massachusetts* the General Court convened on January 1st of the current year and adjourned in early August in advance of the national political conventions, with a number of important matters still to be acted upon. The General Court is scheduled to re-convene in late September to complete its docket.

The following measures more or less bearing on municipal water-supply matters were enacted into law prior to adjournment:

CHAPTER 89.—"An Act Requiring the Providing of Drinking Water on Construction Projects." This legislation makes mandatory the providing of fresh and pure drinking water to employees on construction projects. Violation of the requirements, when certified by the local board of health, is punishable by a fine.

CHAPTER 431.—"An Act to Require Cities and Towns to Shore Trenches on Construction Projects." Chapter 149 of the General Laws is amended under the provisions of this act by the insertion of a Revised Section 129A, reading as follows: "On any construction project carried on by any city, town, county or other subdivision of the Commonwealth in which a trench is to be dug to a depth of five feet or more, except a trench for laying of water pipes dug to a depth of six and one-half feet which will be open less than forty-eight hours, such trench shall be shored and braced in conformity with the rules and regulations for the prevention of accidents in construction operations, as adopted and enforced by the department."

CHAPTER 483.—"An Act Relative to Admission of the Towns of Scituate and Norwell to Membership in the Metropolitan Water District." Section 1. "Notwithstanding the provisions of any law to the contrary, the Metropolitan District Commission may admit the towns of Scituate and Norwell upon application of

such towns to membership in the Metropolitan Water District and furnish water thereto under such terms and conditions as are prescribed by Chapter 92 of the General Laws, notwithstanding the fact that no part of such towns is within fifteen miles of the State House."

CHAPTER 620.—"An Act Establishing in the Department of Natural Resources a Water Resources Division and Defining the Powers and Duties of Said Division". This is a very lengthy piece of legislation outlining among other things the structure of the division of water resources, the powers, duties, etc. of the division and its chairman. It is much too lengthy to incorporate into this report. However, I shall quote briefly from Section 9.

"The Commissioner of Natural Resources shall be the Chairman of the Commission" (as formed in accordance with the provisions of the act). "The Commission shall meet and consult on matters concerning watersheds, water systems, storage basins, both natural and artificial, underground and surface water supplies, and shall study the needs, supplies and resources of the Commonwealth with respect to water conservation and flood prevention."

CHAPTER 685.—"An Act Providing for the Construction of Certain Works and Appurtenances to Meet the Needs of the Metropolitan Water District." Under this Statute, the M.D.C. water division is authorized to proceed with the construction of a pressure aqueduct from the Wachusett Reservoir in Clinton to a point at the start of the pressure aqueduct, so-called, in the city of Marlborough, together with shafts, appurtenant connections and other works as may be found necessary. The Commission is authorized to expend up to $20,000,000 for said purpose and the Commonwealth authorized to float an additional Metropolitan Water District Loan with which to finance it.

The following Resolves were adopted during the legislative session:

CHAPTER 27.—Resolve further reviving and continuing the special Commission established to investigate and study the feasibility of establishing a Southeastern Massachusetts Water District and increasing the scope of such Commission. The Commission, as continued under the provisions of this Resolve, shall investigate all matters pertaining to the subject and report fully with plans and estimates to the General Court on or before May 1st, 1957.

CHAPTER 129.—"Resolve providing for investigation and study by a special commission relative to the system of sewerage and sewage disposal in the North and South Metropolitan Sewer District and the City of Boston and the water system in said districts."

Resolve: "That a special unpaid Commission to consist of two members of the Senate, to be designated by the President thereof, three members of the House of Representatives, to be designated by the Speaker thereof, the Commissioner of the Metropolitan District Commission, or his authorized representative, and three persons to be appointed by the Governor, one of whom shall be selected from

the officials of the member cities and towns of the Metropolitan Water District and one of whom shall be selected from the officials of the municipalities which constitute the North and South Metropolitan Sewerage District, is hereby established for the purpose of making an investigation and study relative to the Metropolitan water supply system and the system of sewage disposal in the North and South Metropolitan Sewer District and in the City of Boston.

"In making said investigation and study said Special Commission shall specifically but without limiting the generalities of the foregoing, consider:

"A. Financial condition of said District with particular reference to the adequacy and fairness of the present rate for water furnished and the methods of assessing operating and other costs as provided under existing statutes.

"B. The advisability of defining geographical limits to the extension of said water and sewerage district.

"Said Special Commission shall report to the General Court the results of its investigation and study hereunder and its recommendations together with drafts of legislation necessary to carry its recommendations into effect by filing the same with the Clerk of the Senate on or before the last Wednesday in December in the current year."

On the subject of Senate Bill 445, petition of Massachusetts Farm Bureau Federation, Inc., by Carleton I. Pickett, Legislative Agent, that provision be made for an investigation and study by an unpaid Special Commission (including members of the General Court) relative to the rights pertaining to surface and sub-surface water, the following order was adopted:

"Ordered, that the Legislative Research Council is hereby authorized and directed to make an investigation and study relative to the rights pertaining to surface and sub-surface water. In the course of its investigation and study said Council shall consider the subject matter of current Senate Document numbered 445. Said Council shall report to the General Court the results of its investigation and study by filing the same with the Clerk of the Senate not later than the second Wednesday in November of the current year."

Numerous measures of purely local character were passed into law during the legislative session.

Your Committee wishes to note that House Bill 1017, an Act relative to payment in lieu of taxes on property held for certain municipal purposes, was referred to the next annual session.

Your Committee further wishes to point out that all bills filed on the subject of fluoridation of public water supply were referred to the next annual session.

Rhode Island

The Rhode Island General Assembly, during its session, enacted Chapter 3799 of the Public Laws of 1956. This legislation is entitled "An Act to provide for the sanitary control of public water supplies". The purpose of the Act as defined in Section 1 is to aid in assuring the safety of all public drinking water supplies. Whereas the entire statute is very lengthy, it is suggested by your Committee that all Association members interested obtain a copy.

Respectfully submitted,

(*Signed*) MARK F. CROKER, *Chairman*
WARREN A. GENTNER
WILLIAM A. HEALY
PHILIP J. HOLTON, JR.
PETER C. KARALEKAS
EDWIN T. MCDOWELL
EDWARD L. TRACY

REPORT OF COMMITTEE ON RECIPROCAL RELATIONS WITH THE INSTITUTION OF WATER ENGINEERS

(London)

As reported last year, your Committee submitted in 1955 to the Institution of Water Engineers a list of papers published in our JOURNAL which the Committee felt were worthy of consideration for the award of the Institution's Reciprocal Diploma of Merit. Following this submission the Institution awarded this diploma to Past President Karl Kennison for his paper, "New York's Quest for Interstate Water", published in the September, 1954, JOURNAL of the Association. This is the second time Mr. Kennison has received the award.

The members of the New England Water Works Association will be interested to note that Mr. H. F. Cronin, Honorary Member of the New England Water Works Association and of the Institution of Water Engineers, an awardee of the New England Water Works Association's Reciprocal Diploma, was made an Honorary Member of the American Water Works Association last May at St. Louis.

It is also appropriate to record the death last August of Sir William Paterson, one of our eminent English members and an Honorary Member of the Institution of Water Engineers.

Respectfully submitted,

DONALD C. CALDERWOOD
PERCY A. SHAW
(*Signed*) E. SHERMAN CHASE, *Chairman*

REPORT OF LIBRARY COMMITTEE

September 10, 1956

Your Library Committee submits the following report on the facilities available at the Association's Office, 73 Tremont Street, Boston.

A brief summary of these facilities is as follows:

A complete file of the N.E.W.W.A. JOURNAL from its inception in 1882 to date. It is gratifying to note that our JOURNAL is of international fame, with subscriptions from several foreign countries.

A file of the A.W.W.A. Journals from 1921 and a complete file of A.W.W.A. Specifications.

Current issues of the major engineering publications and Federal bulletins regarding water works and civil defense.

A reference library of textbooks and other publications that pertain to the water-works and allied fields. Some of these reference books are older editions that have since been revised.

The library facilities are well arranged for convenient reference, and we believe that the value of the library would be considerably increased if the members could become more familiar with it.

The Committee recommends that obsolete editions of standard codes and reference books be replaced with more recent editions.

The librarian would welcome suggestions from members regarding the procurement of recent publications on water-works subjects that would be of value to the general membership.

Respectfully submitted,

(*Signed*) SYDNEY C. BEANE, *Chairman*
FRANK J. TURNBULL

REPORT OF COMMITTEE FOR SURVEY OF GROUND-WATER SUPPLIES IN NEW ENGLAND

September 14, 1956

This committee has attempted to bring up to date information on public ground-water supplies in New England* as previously reported in 1949. In the interest of simplicity and ease of comparison, the same form of tabulation has been used with a few minor changes. These include an additional column for manganese concentration where available and a broader subdivision of gravel wells.

Although a number of uses can be made of the tables, depending on the reader's interests, general observations seem to indicate an increase of about 5% in the number of well installations since previously reported by this committee in 1949. It is also of interest to note that during that same period the type of ground-water installation that has been most frequently developed has been the gravel-packed well.

In connection with the manganese concentration of the supplies reported on, there is an apparent lack of information on this subject, only 17% reporting. Where information was available, however, the concentrations ranged from 0 to 2.4 ppm. Few reported treatment for manganese.

Your committee strongly urges that operators and superintendents of ground-water supplies keep an accurate record of draw-down and yield of ground-water sources, in order that their experience may be of benefit to future ground-water developments.

Respectfully submitted,

M. L. BRASHEARS, JR.
H. N. HALBERG
H. H. POTTER
W. J. SHEA
L. K. SHERMAN
R. M. SOULE
H. J. STEINHURST
J. V. RICHARDS
(*Signed*) F. J. LARIVIERE, *Chairman*

* Data for Massachusetts only are contained in this number of the JOURNAL. It is planned to publish tabulations for other states in the March, 1957, number.

Summary of Symbols Under Various Column Headings in Accompanying Tabulations

Estimated Population Supplied

W — Winter
S — Summer

Type of Well

D — Dug
T — Driven
A — Deep well in rock
Gp — Gravel-packed
Gw — Gravel-walled
Gd — Gravel-developed
S — Spring

Well ends in:

S — Sand
G — Gravel
R — Rock
C — Clay

Treatment

(These symbols were taken from "Notes Regarding State Directories of Water Treatment Plant Data," U. S. Public Health Service, Cincinrati, O., May, 1941.)

A — Aeration
Ac — Aeration, coke bed
F — Filtration
Fs — Filtration, slow sand filters
Fr — Filtration, rapid sand filters
Fp — Filtration, pressure filters
Fz — Filtration, zeolite filter
D — Disinfection
Dh — Disinfection, by hypochlorite
Dc — Disinfection, by chlorine
N — Ammoniation
Ng — Ammoniation, with NH_3 gas
Nc — Ammoniation, by ammonium compound
I — Iron or manganese removal
K — Chemical dosage for corrosive correction or water stabilization
Kp — Chemical dosage for corrosive correction or water stabilization by alkali feed for pH adjustment
Kc — Chemical dosage for corrosive correction or water stabilization by feed of phosphate compounds
Ko — Chemical dosage for corrosive correction or water stabilization by sodium silicate

Type of Pump

G — Gravity
C — Centrifugal
D — Displacement
T — Turbine
A — Air-lift
J — Jet

Supplies Not Included in 1949 Report are indicated by asterisk (*).

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
1*	Abington and Rockland	Municipal	16,112	1.1	1	Big Sandy Pond, Pembroke	Gw			S	1948
2*					1	Walnut St., Abington	Gw	38		R	1949
3*	Acton	West and South Water Supply Dist. of Acton	3,510	.270	2	off Mass. Ave.	Gw	32	24"	G	
4*					20	Reeds Meadow	T	28	2½"	G	1912
5	Adams	Fire District	12,000	1.0	6	Near Hoosick R.	T	106	6"	C	1902
6*					1	Cheshire Harbor	Gp	86	24"		1948
7*					1		Gp		8"		1949
8	Amesbury	Municipal	10,860	.760	100	near Powow River	T	45	2½"		1911-1923
9					1	E. of L. Gardner	D	45	18'		1884
10	Ashland	Municipal	3,500	.800	12	Pleasant St.	T	28	2½"	G	1911
11					31	High St.	T	30	2½"	G	1919-38
12					1	High St.	D	30		G	
13					1	Cedar St.	Gw	64	12"	G.R.	1941
14					1	Cedar St.	Gw	42	12"	G.R.	1942
15	Attleboro	Municipal	25,000	3.012	1	South Attleboro	D	25	30'	S.G.	1892
16					1	South Attleboro	D	40	25'	G	1904
17					2	South Attleboro	Gw	35	36"	G	1936
18*					3	South Attleboro	Gw	30-35	36"	G.R.	1948
19					3	West Mansfield	Gw	29	52"	G	1936
20					88	West Mansfield	T	18-30	2½"	G	1929
21	Auburn	Water Company	Not operated since '49			Ramshorn Brook	T	26	2½"		1919
22*		Water District	3,000		2	Dark Brook	Gp	39	12"	G	1950-52
23*					1	Vinal St.	Gp	58		G	1953
24	Avon	Municipal	2,600	.200	1	West Main St.	D	22	20'		1889
25					1	West Main St.	A	201	8"	R	1889
26					1	West Main St.	A	225	8"	R	1889
27					1	Route 28	Gp	50	24"	G	1945

* Supplies not reported in 1949 report.

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
1		.35	21	6.7	19.	.11	None	T		None	Auxiliary Source
2	415	.38	50	6.7			Kp	T			
3		.30	109	6.1		.00	None	T	300 (each)		
4	270	.08	62	6.2			None	D			Abandoned
5	1,730	2.5	128	7.7	1.0		Dc	D	2,990		
6	1,600	.07	106	7.5			None	T	1,400		
7	700							T			
8	900	.32	72	7.5	9.	.02	AcFs DcKp	D	1,200		
9							None	D	50	None	6" Tubular Well in bottom of a dug well
10											Abandoned
11		.11	30	6.2		.11	None				Auxiliary
12											Abandoned
13		.03	91	7.0		.04	IFz				
14											
15								C			
16	1,000	.02	26	6.2	12.5	.01	Akp		2,780		
17	630	.04	78	6.2	21.5	.02		TC			
18	630	.02	27	5.8		.02					
19	300	.10	34	6.9	7.5	.04	DcKp	C	500		
20	630										Abandoned; consideration being given to rehabilitation in 1955
21											Abandoned
22*	500	.02	27	5.8	20	.00	Kp	T	440		
23*	150				33						
24		.01	50	5.8		.00	None		500	.07	
25											Abandoned
26											Abandoned
27		.01	42	6.1		.00	None	T	220		

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
28	Ayer	Municipal	5,740 W	.617	1	Grove Pond	D	18	25′		1887
29			8,000 S		43	Grove Pond	T	34	2½″		1906
30[R]					2	Grove Pond	Gp	62	24″	G,S	1943,52
31	Barnstable	Water Company	5,000 W		19	Mary Dunn Pond	T	25′-35′	24″	S	1912
32			13,000 S	.860	30	Mary Dunn Pond	T	30′	2½″	S	1925
33					33	Cedar Swamp	T	30′	2½″	S,G	1926
34*					4	Maher Field	Gp	70′	24″	S,G	1946
35*					1	Hyannisport	Gp	75	8″	S	1953
36*		Fire District	1,100 W								
			1,500 S	.077	1	So. of village	Gw	60′	48″	S	1954
37		Cotuit Fire District	1,200 W	.120	5	Lovells Pond	Gw	30		S	1936
38*			5,000 S		1	High St.	Gp	40	24″	S	1952
39		Centerville-Osterville	3,500 W	.480	50	McShane Field	T	45-50	2½″	S	1938
40		Fire District	20,000 S		3	Arena	Gw	60	54″	S	1938
41*					1	Route 28	Gp			S	1945
42*					4	Craigville	Gp	45	12″	S	1954
43*	Barre	Municipal	2,100	.180	1	Prince River	Gd	65	6″	G	1940
44	Bedford	Municipal	5,200	.400	27	Shawsheen R.	T	27	2½″	S,G	1925
45					1	Kendrick Pond	D	21	20′	S,G	1908
46					1	Shawsheen R.	D	17	54″	S,G	1939
47*					1	Shawsheen R.	Gp	29	24″	G,S	1943
48	Belchertown	Water District	4,500	.050	9	Jabish Brook	T	32	2½″		1925
49	Bellingham	Municipal	4,100	.507	1	Peters Brook	G	41	48″	G	1939
50*					1	Peters Brook	G	30		G	1953
51	Bernardston	Fire & Water District			1	Mill Brook	D	30	13′	S	1936
52	Billerica	Municipal	11,000 W	.570	2	Concord R.	Gw	38	42″	G	1932
53			15,000 S		1	Concord R.	Gw		48″		1948
54	Blackstone	Municipal			2	Mill Brook	Gp	41		S	1951,52

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
28	160										Abandoned
29	275										Abandoned
30	700	.05	60	6.7	28.	.00	None	T	500		
31		.15	18	5.7			Kc				Auxiliary
32											
33											
34		.33	17	6.2		.00	Kc	C	1,200		
35	170	.18	20	5.6	5.5	.00					
36								T	400		
37	500	.14	15	5.6	15		Kc	C	500		
38	350	.08	17	5.8	10	.01	Kc	T	400		
39	500	.06	10	5.7	9	.06		C	250		
40	350	.03	10	5.4	13			C	250		
41		.03	13	5.3	18	.00					
42											
43		.92	16	5.9				T	210		
44	250						Dh				
45	40				11.						
46		.01	35	6.1	31						
47											
48	100				15		None	D	200	.050	
49	320						None	T			
50	150				12						
51	70				2.		None	T	100		
52		1.5	30	6.5	11.	.50	Dc	T			Treatment plant under construction to treat water from Concord R.
53		1.4	33	6.2		.40	Dc	T			
54	160	.07	26	6.1	32	.00	None	T			

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
55	Bourne	Bourne Water District	2,700 W 9,000 S	.272	3	County Road	Gw	49-71	54"	S	1939
56*					1	Route 28	Gw	68	54"	S	1954
57		Buzzards Bay Water District	2,000 W 3,800 S	.112	25	Bournedale Road	T	32-68	2½"	S	1937
58		No. Sagamore Water District	180 W 320 S	.042	18	Sagamore Beach	T	50	2½"	S	1928, 1948
59*		So. Sagamore Water District		.040	10	off Route 6	T	60	2½"	S	1948
60		Ware tenement			4		T	58	2½"	S	1914
61*	Boylston	Water District	500	.020	1	Route 140	Gp	75	12"	SG	1952
62*		Morningdale Water District	750	.024	1	Route 70	Gp	70	12"	G	1950
63	Bridgewater	Municipal	9,510	.370	31	Matfield R.	T	28-40	2½"	SG	1915, 1925
64*					2	High Street	Gw	66	60"	G	
65	Brookfield	Municipal	1,567	.100	3	Quaboag R.	T	12	3'-4'		1931
66					15	Quaboag R.	T	12	2½"		1931
67	Brookline	Municipal			175	Charles R.	T	40-90	2½"		1889-1894
68					4	Charles R.	Gw				
70*	Burlington	Municipal	3,250	.151	30	Vine Brook	T	37	2½"	SG	1950
71	Canton	Municipal	7,500	.890	19	Springdale	T	20-40	2½"	G	1893
72					1	Springdale	D	25	40'	G	1889
73					1	Ward Well	D	25	35'	G	
74					1	Henry's Spring	D	24	40'	G	1894
75					1	Henry's Spring	Gw			G	
76*					1	Neponset R.	Gw	42'	24"		1952
77	Chatham	Water Company	2,500 W 4,500 S	.287	38	Chatham-Harwich line	T	29-36	2½"	S	1933-1935
78*					2	Chatham-Harwich line	Gw	38	54"	S	

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
55	1.152	.02	8	6.1			None	C	800		
56*	315	.02	20	6.2	6.5	.00	None	T	500		
57	.700	.03	8	5.9				C	275		
58		.07	16	5.8		.00	None		250		
59*		.06	16	6.0			Kc		260		
60											Abandoned — Now served by So. Sagamore Water District
61*	700	.02	29	6.3		.00		T	300	.020	
62*	425	.18	31	6.1	29			T	500	.024	
63											Abandoned
64*		.10	20	58	19	.00		T	600		
65		5.1	25	8.5			IKp	D	75		Also surface supply
66											
67											
68											Now supplied entirely by Metropolitan District Comsion
70*	300	.10	33	6.4					300	.151	
71		.04	30	5.9		.00					
72											
73											Abandoned
74		.05	35	6.2		.00					
75		.02	32	6.0		.02					
76*	225	.02	34	6.1	30	.00					
77											
78*		.13	9	5.7				T		.287	

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
79	Chelmsford	Water District	6,000	.334	25	River Meadow Brook	T	40	2½"	G	1940
80*					1	River Meadow Brook	Gp				1954
81		North Chelmsford Fire District	3,700	.231	30	Newfield Pond	T	35	2½"	G	1907
82*					1	Bomil Field	Gp			G	
83	Cohasset	Municipal	4,200 W	.456	62	Near R.R. Station	T	12'-40'	2"	G.R.	1886
84			4,900 S		7	Elms Meadow	T	20'-38'	2½"	G.R.	1887
85					1	King St. at Lily Pond	Filter Gallery	200x 8x12			1901
86					1	Beechwood	D	25	25'		1908
87*					2	Sohier Road	Gp	32	24"	G	1952
88	Colrain	Kendall Co.			1	Griswoldville	A	291	10"	R	
89					1	Lyonsville	S			S	
90					1	Lyonsville	A			R	
91*	Concord	Municipal	10,870	.935	1		Gw	75	48"	G	
92	Cummington	Municipal			4	S.W. of Village	S			R	1930
93*					1		T			R	1954
94	Dedham	Water Company	24,324	1.798	35	Charles River	T	20-35	4"	S.G.	1897-1914
95					8	Charles River	T	35-40	8"	S.G.	1915-1936
96					1	Charles River	T	67	16"	S.G.	1928
97					3	Charles River	D	18-30	26,8	S.G.	1881-1913
98					1	Charles River	Gp		25"	S.G.	1944
99					1	Charles River	Gp	60	25"	S.G.	1928
100*					1	Dover Road	Gp				1951
101*					1	Rock Meadow	Gp				1953
102*					1	Route 128	Gp				1954
103	Deerfield	Fire District			4	Scattered	S				1911
104					8	Deerfield R.	T				1930
105*					1	Off Route 5	Gw	36	36"		1949

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
79	700	.71	33	5.9	23	.00					
80*											
81		.40	28	6.1	26						
82*		.02	26	6.0		.08					Abandoned
83	500										Auxiliary
84	165										Abandoned
85											
86		1.9	24	5.7	19	.15	AcDcFr	C	550		
87*		.02	70	6.5		.00	None	T	250		
88		.02	68	7.4	4						
89		.03	40	6.7	6						
90		.02	75	7.5	4						
91*		.08	37	6.4			None	T	700		Auxiliary to surface supply
92		.03	21	5.9							
93*											Auxiliary during drought
94											Abandoned
95											Abandoned
96											Abandoned
97							Dc				
98							Dc				
99							Dc				
100*		.03	45	6.2			Dc				
101*							Dc				
102*											
103		.12	34	6.2							
104		.28	25	6.6	7						
105*		.03	26	6.4			K	T	170		

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
106*	Dennis	Water District	2,550 W		1	Route 6	Gw				1947
107*					1	Old County Road	Gw	50	8"		1955
107A*	Dighton	Water District						51		S,G	
108	Douglas	Municipal	2,600		7	Bad Luck Pond					
						Brook	T	32	2½"		1909
109	Dover	Municipal			2	Church Street	T		2½"	G	1927
110		Dover Green Water Co.			2	Normandie Rd.	D				
111	Dracut	Water Supply District	8,600	.480	16	Hopkins Street	D	20-30	4'	G	1922-1928
112					15		T	28'	2½"	G	1905
113*					1	Tyngsborough	Gp				1954
114	Dudley	Municipal	5,200	.463	38	Merion Pond	T	35	2½"		1900
115	Dunstable	Municipal			6	Black Pond	T	25	2½"		1930-1936
116					1	Austin Pond	D	30	12'		1917
117	Duxbury	Water District	3,100 W	.400	44	Fords Pond	T	30-50	2½"		
118*					1	Fords Pond	Gp				1948
119*					1	Depot Street	Gw				1954
120	East Brookfield	Municipal	1,250	.050	1	Lake Lashaway	D	15'			1917
121	Easthampton	Municipal	10,600	1.685	37		T	40'	2½"		1908-1924
122	Easton	N. Easton Village District		0.265	1	Lincoln Street	D	27	29'	S.G.	1887
123					1	Lincoln Street	S				
124					1	Off Centre Street	Gp	62'	48"	S,G	1953
125	Edgartown	Water Company	1,500 W	0.154	1	Great Pond	D	19	15"	S	1906
126			5,000 S		17	Great Pond	T	35	2½"	S	1927
127					1	Shurtleff	Gp	42	10"	S	1945
128*					1	Shurtleff	Gp	57		S	1953
129*	Essex	Municipal	1,561		1	Pond St. Essex	Gp	36	24"		1948
130*					1	Pond St. Essex	Gp				1955

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
106*		.14	5	5.9			None				
107*	135	.02	8	5.7							
107A*	150										
108		.02	25	6.1		.00					
109		.36	59	6.6							
110											
111											Abandoned
112		.09	72	6.4			Dh				
113*		.17	19	6.1							
114		.07	19	6.1							
115		.12	26	6.3							
116											
117		.07	17	5.9							
118*		.07	17	6.3							
119*											
120		.29	14	6.0							
121		.02	51	8.1							
122		.07	18	6.0				C	450		
123		.02	14	5.5							
124	350	.01	14	5.5			Kc				
125		.01	7	8.6	9.5			D	300		
126		.01	26	6.2	9.5			D	300		
127		.01	26	6.2			Kpc	T	600		
128*	287	.02	24	5.5	22		Kpc	T	550		
129*	210	.03	27	6.0	37.	.11	Kc				
130*		.13	44	6.3							

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
131	Fairhaven	Water Co.	12,000	1.080	36	Nasketucket River	T	25-30	2½"	G	1893
132					31	Mattapoisett River	T	30	2½"	G	1901
132A*	Falmouth	Municipal	38,000 S‡	1.26	40	Waquoit	T	62	2½"	S	1942
133	Foxborough	Municipal	7,000	1.400	24	Nr. Neponset Res. (old)	T	23-50	2"		1892
134					23	Nr. Neponset Res. (new)	T	28-50	2½"		1922
135*					3	Nr. Neponset Res.	Gw	50	24"		1952
136*					2	South St.	Gw	43	24"		1953
137	Framingham	Municipal	28,500	3.315	1	N. of Lake Cochituate	Gp	69	8"	SG	1939
138					1	N. of Lake Cochituate	Gp	69	8"	SG	1939
139					1	N. of Lake Cochituate	Gp	78	8"	SG	1939
140	Franklin	Municipal	8,000	0.610	12	Beaver Pond	T	22-23	24"	G	1924
141					6	Beaver Pond	T	22	30"	G	1925
142					8	Beaver Pond	T	22	2½"	G	1911
143					1	Beaver Pond	D	22	20"	G	1906
144					1	Beaver Pond	Gw	38	24"	G	1944
145					1	Beaver Pond	Gw	62	24"	G	1945
146	Georgetown	Municipal	1,300	0.038	19	Parker River	T	26-34	2½"		1917
147					1	Parker River	T	125	8"		1934
148	Gill	Riverside Water Co.	350			Riverside	S				1888
149	Gosnold	Municipal	130		1	Cuttyhunk	D	35	7'	G	1890
150	Grafton	Water Co.	2,200	0.257	1	Quinsigamond	D	17	10'		1887
151	Grafton	Water Co.			1	Quinsigamond	D	28	25'		1910
152	Grafton	Water Co.			1	Quinsigamond Tributary	Gp	36	16"		1930
153	Grafton	Fisher Mfg. Co.			5	Leland Hill	S				
154	Grafton	Fisher Mfg. Co.			2	Blackstone River	T	200-300	8"		
155	Grafton	Saundersville W. S.			5	Leland Hill	S	14	Varies		
156	Grafton	Saundersville W. S.			1	Blackstone River	D	10	10"		
157*	Grafton	S. Grafton Water Dist.	3,000	.308	1	So. Grafton	Gp	37	12"		1952

‡ 9,800 W

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
131		.35	41	5.7		.00	None	D	800		
132		.06	25	5.8		.00	Kc	D	700		
132A*	400	.03	12	5.5	12.	.00		C			Auxiliary to Surface Supply
133	485	.43	19	6.3			None				Abandoned
134							None	C	900		Abandoned
135*	210	.02	24	6.0		.10	Kc	T	1,900		
136*											
137	1,040	.03	71	6.9		.00	None	C	700		
138	1,040	.34	60	6.4		.00	None	C	700		
139	1,040	.03	50	6.6		.00	None	C	700		
140							None				
141		.10	23	6.0				D	1,000		Abandoned
142											Not in use
143	350										
144	350	.25	22	6.1		.36	Dc	C	750		
145	350										
146		.07	30	6.3		.04	Ac	C	113		
147		.17	46	6.6		.17					
148		.05	40	6.6		.00	None	G			
149		.02	43	8.1			None	D	—		
150		.13	50	6.4			Kc	C	300		
151		.13	50	6.4			None	C	300		
152		.08	31	6.1		.00	None	C	300		
153		.01	48	6.4			None	G	—		Abandoned
154							None	D	30		Abandoned
155		.19	16	6.3			None	G			Abandoned
156		.13	50	6.4			None	D	30		Abandoned
157*	300	.09	36	6.9	11.	.00					

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
158	Granville	Central Water Co.			3	¾ mile W. of town	S	10	38′	S	1910
159	Great Barrington	Fire District	3,000	0.707	1	Nr. Green River	Infiltr. Gallery			G	1934
160	Greenfield	Municipal	17,300	1.958	1	3 mi. No. of town	D	27	40′	G	1937
161*	Greenfield				2	3 mi. No. of town	Gp	105	12″	R	1947
162	Groton	Water Company	1,600	.330	1	Braddacook Pond	D	19	30′		1897
163	Groton	Water District (West)	800	.198	8	Squannacook River	T	26	2½″		1911
164	Hamilton	Municipal	2,600	.180	6	½ mi. So. East of Milas River	T	26-33	2½″	G	1939
165	Hamilton				1	½ mi. So. East of Milas River	D	16	15′	C	1910
166	Hamilton				1	½ mi. So. East of Milas River	Gp	32.3	6″	G	1939
167	Hamilton				1	½ mi. So. East of Milas River	Gp	49.5	6″	G	1939
168*					1	Chittick Swamp	Gp	29	8″		1950
169	Hanover	Municipal	3,400	0.656	24	Third Herring Brook	T	43	2½″	S	1930
170	Hanover				1	Third Herring Brook	Gp			SG	1943
171*	Hanover				1	Pond St.	Gp	65	24″	G	1955
172	Hardwick	Municipal			1	½ mi. No. of Village	D	10	24 x 12		1913
173	Hardwick	Gilbertville Water District	1,325		1	⅛ mi. West of mill	D	14.5	21′		1910
174	Hardwick	Gilbertville Water District			2	⅛ mi. West of mill	D	14.5	39′		1922
175	Hardwick	Gilbertville Water District			4	200 ft. from dug wells	T	128-197	6″		1911
176*	Hardwick	Gibertville Water District			1	High St.	T	750	8″		1952
177	Hardwick	Wheelwright Water District	235		4	Nr. Hardwick Sta.	T	31	2½″		1904-1908
178*		Wheelwright Water District			1	Barre Rd.	Gp	46	12″	S	1952
179	Harwich	Municipal	2,600 W 4,000 S	.316	4	No. of Chatham Rd.	G	32-38	6″	S	1936
180*	Hadley	Water District			1	2½ mi. No. of Village	Gd	208	12″	SG	1953

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
158		.10	19	6.4			None	G			
159		.06	91	7.3			Dc	C	1,420		
160		.06	43	7.1			Fs,Dc		2,080		
161*		.07	28	6.4			Kp				
162		.34	51	6.3			Kc	D	450		
163		.02	35	6.6		.41	None	C	100		
164	225	.08	41	6.2			None	C	227	.060	
165							None				Abandoned
166							Kc				
167							Kc				
168*	200	.04	66	6.1			Kc		175		
169	175	2.6	38	5.9				C	320		Abandoned
170	700	.23	28	5.8	36	.70	None	T	500		
171		.39	29	5.8	20	.35	None	C	500		
172		.03	75	7.9			None	G			
173		.03	33	6.6			None	G			
174		.07	25	6.9			None	G			
175		.04	38	7.0		.00	None	D	22-42		
176*	27							T			
177		.17	12	6.2			None	D	28		
178*		.03	4	6.0	7.	.00		T			
179	700	.00	16	6.1			None	C	500	.316	
180*	278	.04	98	7.9				T			Auxiliary to Surface Supply

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
180A	Hingham	Water Co.	14,000	2.595	1	Fulling Mill Pond	D	22'	40'	S	1903
181	Hingham	Water Co.	14,000	2.595	1	Free Street	Gp	86	24"	S&G	1944
182	Hingham				1	New Free Street	Gp	86	24"	S&G	1954
183	Holliston	Municipal	3,300	.275	2	Winthrop Pond	Gp	45	6"	SG	1937
183A*	Hopedale	Municipal	3,500	.263	27	So. of Mill St.	T	47	2½	SGR	1948
184	Hopkinton	Municipal	2,900		26	Fruit St.	T	35	2½	G	1929
185*	Hudson	Municipal	8,000	0.767	15	Cox St.	T	24	2½	S	1945
186	Huntington	Fire District	1,000		9	Westfield River	T	22	3	G	1908
187*	Ipswich	Municipal	6,900	.664		Mile Lane	Gp	50	24	G	1943
188*	Ipswich					Brown Well	Gp	50	24	S	1942
188A*	Ipswich					New Brown Well	Gp	50	24	S.G.	1954
189	Kingston	Municipal	3,400 W 3,800 S	0.439	34	Soules Pond	T	26-41	2½	G	1897-1922, 1940
190*	Kingston				2	Howland's Lane	Gp	94	12"	S	1955
191	Lanesborough	Village Fire & Water District	1,500	0.120	15	Nr. Housatonic R.	T	31	2½		1938
192*	Lanesborough				1	Nr. Housatonic R.	Gp	52	12"	R	1954
193	Leicester	W.S. District	1,200	0.100	1	Pierce Meadow	D	14	30		1890
194	Leicester				5	Paxton	T	14	6		1891
195	Leicester				1	Paxton	T	18	6		1903
196	Leicester				1	Paxton	T	150	4¾		1905
197	Leicester	Cherry Valley & Rochdale Water Dist.	2,300	0.180	2	Henshaw Pond	D	12	30		1910
197A*	Leicester	Hillcrest Water Dist.	300	.060	1	Pleasant St.	A	400'	8"	R	1955
197B	Leominster	Municipal	24,787	5.126	1	Wass Meadow	Gp	39	12"	G	1951
198	Littleton	Municipal	2,300	.239	9	Beaver Brook	T	20	2½		1912
199	Lowell	Municipal	101,400	7.409	620	No. Bank Merrimack	T	24-46	2½	G	
200	Lowell				30	No. Bank Merrimack	G	35	6	G	1935
201	Lowell				210	River Meadow Brook	G				

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
180A		.00	22	8.1		.00	KpDh	C	1,000		Dug well fed by collecting system
181		.01	81	6.6		.00	KcDh	T	660		Surface supply also
182		.01	96	6.7		.00	KcDh	T	660		
183	195	.23	30	6.4		.06	None	C	250		
183A*		.10	49	7.0			Kp				
184	415	.02	27	6.3			None	D	316		
185*		.02	33	7.3		.00	Kp				Surface supply also
186	200	.00	12	6.2	8.		None	D	100		
187*		.06	79	7.7	6			C	200		
188*		.15	157	7.8				C	500		Abandoned because of sand
189	255	.03	15	6.4	16.		None	D	300		
190*	1,050	.14	15	6.4					600		
191		.02	156	7.5	5.		None	C	150		
192*		.03	210	7.6							
193		.10	26	6.3	13.		None	G			
194							None	G			
195							None	G			
196							None	D	70		
197		.16	19	6.6	6.		None	D			Abandoned
197A*	60	.05	54	7.8		.00	None				Also supplied by Leicester W.S. District
197B	500	.02	47	6.1	40.	0.0	Kp				Surface supply also
198	275	.10	33	6.1	15.	.00	None	D	210		
199		.24	36	6.5	22.	.70	AcFsDc				
200							AcFsDc	D			
201		1.25	76	6.6		1.3	AcFsDc				

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES *(Continued)*

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
202*	Lowell	Municipal	97,249	8.164	4	Black Brook	Gp	69		S	1949
203*					4	Bowers Field	Gp				
204*					4	Boulevard	Gp	62		S	1954-1955
205	Lynnfield	Center Water District	3,927	0.236	30	Phillips Rd.	T	35	2½"		1940
206	Manchester	Municipal	2,868	0.382	1	Saw Mill River	D	29	32'	G	1892
207					25	Saw Mill River	T	27-65	3', 4'		1901
208	Mansfield	Municipal	7,184	1.842	1	Pecuanticiot R.	D	20	30'	G	1888
208A*					1	Pecuanticiot R.	Gw				1949
209*					1	Witch Pond	Gw	37	8"		1953
210*					2	Greenwood Lake	Gw	38	8"		1953
211	Marblehead	Municipal	11,000 W	0.816	1	Logg's Hill	D	33.5	25'		1912
212			15,000 S		16	Thompson's Meadow	T	34-73	2½"		1923
213	Marion	Municipal	1,867 W	0.211	22	Benson Brook (old)	T	20-30	2½"	S,G	1908-1930
214			3,734 S		25	Benson Brook (new)	T	31-39	2½"	G	1915-1938
215*					1	Benson Brook	Gw	25	24"	S,G	1947
216*					1	Benson Brook	Gw	25	24"	S,G	1947
217	Marshfield	Municipal	3,267	0.717	60	Main P.S.	T	20-36	2½"	G	1927-1930
218					7	Humarock Beach P.S.	T	22	2½"	G	1900-1920
219					1	Brant Rock P.S.	D	19	22'	G	1927
220*					1	Parsonage P.S.	Gp	39	12"	S.G.	1955
221*					1	Furnace Brook	Gp	90	12"	S.G.	1950
222*					1	Furnace Brook	Gp	93	8"	G	1950
223	Mattapoisett	Municipal	2,265	0.173	24	Mattapoisett R. (old)	T	24-28	2½"	S	1913-1923
224					24	Mattapoisett R. (new)	T	28-35	2½"	S	1924
225*					1		Gp	31	54"		1953

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
202		.17	56	6.5		.11		T			
203*		.21	39	6.5		.18		T			
204*		.02	50	6.3	30	.81					
205		.01	99	7.4	5		None	C			
206		.08	43	6.2	33		Kp	D	350	.360	
207		.10	38	6.3			Kp	D	350		
208 208A		.04	19	6.0	19		None	D	1,390		
209*	315	.04	22	5.9		.05					
210*	225	.01	26	6.2							
211	300	1.11	68	6.5	27		AgFs	C	250		Abandoned—Now supplied
212	200	1.43	105	7.1	22		Fs	C	120		by M.D.C.
213		.05	23	5.8	21.		None	D	350		
214		.08	38	6.4	16		None	D	350		
215*	300	.03	13	5.5			None				
216*	100	.01	18	5.7			None				
217		.35	10	6.1			None	D	500		
218		1.10	19	5.6			None	D	250		Abandoned
219		.07	12	5.9			None	D	500		Abandoned
220		.10	34	5.6			None				
221*		.04	16	6.3			None				
222*	1,000	.03	28	6.0			None				
223		.12	31	6.3	27		None				
224		.05	23	6.0	23		None				
225*		.02	22	5.7			Kc				

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
226	Medfield	Municipal	4,549	0.143	63	State Hospital (old)	T	31-35	2½"		1932
227	Medfield					State Hospital (new)	T				
228	Medway	Municipal	3,744	0.136	20	Charles River	D	18-20	30'	G	1916-39
229	Medway				2	Charles River	Gp	61	24"	G	1942
230	Merrimac	Municipal	2,200 W 2,300 S	0.172	32	S.W. of Lake Attitash	T	23-46	2½"		1904-16, 1930
231	Methuen	Municipal	24,477	1.342	1	Harris Brook	G	47	18"	G	1937
232	Methuen				34	Merrimac River	T	18-34	2½"	G	1922
233	Methuen				1	Merrimac River	G	54	16"	G	1939
234	Methuen				1	Merrimac River	G	93	16"	R	1930
235	Methuen				1	Merrimac River	G	88	16"	R	1930
236	Methuen				1	Merrimac River	G	88	16"	R	1930
237	Middleborough	Municipal	10,164	0.488	1	Nemasket River	D	22	26"		1885
238*	Middleborough				2	Rock Village	Gw	49	24"	S	1946
239	Milford	Water Co.	18,366	0.805	2	Charles River	D	25-28	14'	G	1949
240	Milford				24	Charles River	T	44	2½"	G	1949
241	Millbury	Water Co.	8,347	0.625	1	Millbury Ave.	D	35	20'		1894
242	Millbury				1	Quinsigamond R. Trib.	G	36	16"		1930
243	Millis	Municipal	2,551	0.336	1		D	12	8' x 16'	G	1892
244					1		D	9	24'	G	1895
245					1		D	10	24'	G	192?
246					1		D	23	23'	G	1930
247*					1		Gp	48	24"		1952
248	Monson	Municipal	6,125	0.511	2	Nr. Ingalls Brook	T	25	2½"	G	1894
248A*	Monson				1	Off Toby Rd.	Gp	53	24"	G	1949

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
226		.03	48	6.2				C	900		Gp well installed 1955 (Charles River)
227		.03	45	6.5			Kp				
228		.01	47	6.7				D	350		
229		.01	24	6.4							
230		.35	37	6.2	30.	.34	None	C	558	.172	
231		1.2	35	6.2	33		Dc	T	280		
232		.05	43	6.1	—		Dc	D	280		
233		.04	35	6.3	25		Dc	T	150		Not in use
234		1.7	48	6.6	21		Dc	T	300		Now supplied by Lawrence
235		1.18	48	6.7	24		Dc	T	200		
236		.28	47	6.7	23		Dc	T	200		
237		0.7	35	6.6			Ac	C	900	.310	
238*	500	0.5	16	5.8	14.	.00					
239		1.8	34	6.1			KpDc	C	1,390		
240		.64	37	7.6			KpDc				
241		.07	27	5.9	29.	.00	None	C	900		
242		.03	26	6.0			None	C	300		
243		.03	72	6.7	—		None	C	450		
244											
245											
246											
247*		.02	68	6.4	—	.00					
248		.17	14	6.4	3.		Dc	G			
248A*		.06	25	6.4	8.	.00	None				

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
249	Montague	Bartlett Water Co.	320	0.009		½ mi. So. of Village	S	4	30'	G	1940
250	Nantucket	Siasconset Water Dept.	3,484	0.814	4	Siasconset	D	28	15'	S,G	1924-36
251	Nantucket	Wannacomet Water Co.	2,900 W	0.047	121	Wyers Valley	T	26-34	2"	S	1911-35
252	Nantucket	Wannacomet Water Co.	13,325 S		4	Wyers Valley	D	20-22	8'	S	1924-26
253	Natick	Municipal	19,838	2.278	1	Worcester St.	D	25	30'	S,G	1902
254	Natick				1	Worcester St.	G	63	54"		1948
255	Needham	Municipal	16,313	1.698	1	Dedham Ave.	D	24	22'	G	1890
256	Needham				1	Dedham Ave.	D	30	20'		1900
257	Needham				23	Dedham Ave.	T	10-20	2½"		1914-24
258	Needham				38	Great Plain Ave.	T	25-30	2½"		
259	Needham				1	Charles River Sta.	G	90	24"		1941
260	Needham				1	Charles River Sta.	G	93	24"		1944
260A*	Newbury	Byfield Water Dist.	950		12	Larkin St.	T	27-40	2½"	S&G	1948
261	Newburyport	Municipal	14,111	1.996	26	Trout Brook	T	87-252	6"		1904-08
262	Newburyport				3	Jackman Ravine	D	15			1890
263	Newburyport						D	15			1890
264	Newburyport						D	40			1895
265	Newburyport				2	Valley of Trout Br.	S	50		S	—
266*	Newburyport				1	Off Ferry Rd.	Gp	56		S	
267	Newton	Municipal	77,300	6.108	1	Charles River	Infiltr. Gallery	4	4400x4	G	1885-89
268	Newton				300-400	Charles River	T	40-70	2½"	G	1889
269	Newton				1	Charles River	D	38	28'	G	1911
270	Newton				1	Charles River	D	42	33'	G	1927
271	Newton				1	Charles River	D	41	20'	G	1938
271A	Newton				1	Charles River	D	32	20'	G	1938
272*	No. Adams	Municipal	21,567	2.853	1	Phelps Ave.	Gp	191	12"	R	1953
273*	No. Adams				1	Holland & State	Gp		8"		1954
273A*	Northampton	Municipal	29,063	3.303	1	Off Ryan St.	Gp	85'	24"	S,G	1950
273B*					1	Off Spring St.	Gp	85'	24"	S,G	1951

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
249		.01	34	6.7	18		None	D			
250		.04	26	6.5	16.		None	D	160		
251		.01	25	6.5	11.		None	D	500		
252											
253		.02	67	6.8				C	2,780		
254	1,000	.04	81	6.8	17.	.00	Kc	T			
255		.03	47	6.1				D	1,000		
256											
257		.09	41	6.3							
258		.25	38	6.5							
259		.02	67	6.9		.00		T			
260		.01	64	6.7		.00		T			
260A*		.07	106	7.7							
261											Abandoned
262											Abandoned
263											Abandoned
264											Abandoned
265											Abandoned
266*		.04	27	6.6	17						
267							DcNg				
268											
269		.04	32	6.4			DcNg	C			Abandoned—Now supplied by M.D.C.
270		.03	49	6.4			DcNg	C			
271		.02	44	6.3			DcNg	C			
271A		.02	52	6.3			DcNg	C			
272*		.08	96	7.9		.00	None				
273*		.02	72	7.5		.00					
273A*	700	.18	30	6.7	4.	.00		T			Auxiliary to Surface Supply
273B*	600	.10	16	6.6	5.	.00		T			Auxiliary to Surface Supply

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
274	N. Attleborough	Municipal	14,000	1.408	1	No. Attleborough	D	29	25'	G	1884
275	N. Attleborough				1	Plainville	D	30	28'	G	1905
276*	N. Attleborough				3	Plainville	Gw	27	8'	G	1955
277	Northbridge	Whitinsville Water Co.	10,500	0.905	20	Sutton's Wells	T	18	2		1919
278	Northbridge	Whitinsville Water Co.			32	Meadow Brook	T	25	2		1922
279	Northbridge	Whitinsville Water Co.			12	Blackstone River	T	33	2½		1932
280*	Northbridge	Whitinsville Water Co.			1	Whitin Pond	Gp	38-40	12-18		1949
281*	No. Reading	Municipal			1	Central St.	Gp	28			1954
282	Norton	Municipal	4,400	0.317	22	Nr. Three Mile Riv.	T	30-40	2½	S,G	1912 on
283*	Norton				3		Gp	71	8"	S,C	1955
284*	Norwell	Municipal	2,515	0.041	1	Pleasant St.	Gd	64	8"	S,G	1955
285	Norwell										
286	Norwood	Municipal	16,500	1.404	133	Ellis Sta.	T	28-45	2½	SG	1900-21
287*	Norwood				2	Ellis Sta.	Gp	59	8		
288*	Norwood				1	Buckmaster	Gp	56			
289	Oak Bluffs	Municipal	1,521	0.227		Lagoon Pond	Collecting System				1890,
290*					1	Crystal Spring	S				1910
290A*	Orange	Municipal	5,894	.467	1	Magee's Meadow	Gp	72	12"	S,G	1944
291	Oxford	Water Co.	5,851	0.328	8	French River Trib.	T	28	2½		1906
292	Oxford				7	French River Trib.	T				1914
293	Oxford				10	French River Trib.	T				1925
294	Palmer	Fire Dist. No. 1	2,800	0.178	8	Nr. Quaboag River	T	30	2½	S,G	1922
294A	Palmer	Bondsville Water Co.	1,181	0.182	10	Nr. Quaboag River	T	37	2½	G	1908
294B	Palmer	Cheney Co.	1,700		1	Nr. Quaboag River	T	80	8	G	1940
294C*	Palmer	Three Rivers F. D.	3,000	0.135		So. of Ware R., E. of Village	T				

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
274		.10	53	6.6	7.5		DcKp				
275							DcKp		750		
276*	880	.02	18	6.3		.00	Kp	C	750	1,500	
277		.03	7	6.0	19		None	C	850		
278		.17	42	6.4	26		None	C	600		
279		.03	27	5.8	28.		None	D	110		
280*		.07	25	6.1			Kp				
281*		.02	30	6.3					450		
282		.18	19	6.0	19		None	D,C	250		
283*		.15	17	6.3							
284*											
285*									470		
286		.04	70	6.4			A,Fs,Kp	D	1,040		
287*		.03	69	6.8							
288*	350	.02	38	5.9							
289		.25	16	6.2	10.5		DcKp	C	500		
290*		.06	13	6.3							
290A*		.05	14	6.0							
291		.03	30	6.3	16		None	C	300		
292											
293											
294		.02	12	6.6							
294A		.35	26	6.2	13		None	D	100		
294B		.04	16	6.6	2.0		None	D			
294C*											

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
295	Paxton	Municipal	1,066	.055	1	Shore of Asnebumskit Pd.	S	7	40		1936
296	Pepperell	Municipal	3,400	0.274	34	Banks of Gulf Brook	T	32	2½		1909
297*	Plymouth		13,608	1.304	2	Manomet Lout Pond	Gp	117	18"	S	1953
298	Provincetown	Municipal	3,795	0.449	50	North Truro	T	21-41	2½	S	1907-28
299	Provincetown				3	Provincetown	Gp				
300*	Provincetown				8	North Truro	Gp	59	12"	S	1954
301*	Raynham	N. Raynham Water Dist.	2,426	.029	10	No. Raynham	T				
302	Reading	Municipal	14,000	1.110	76	Ipswich River	T	38	2½		1930
303*	Reading				1	SE of Aberjona R.	Gp	38	2½	S&G	1950
304	Rockport	Municipal	4,231	0.394	23	Mill Brook Valley	T	21-37	2½	G	1926-38
305	Rowley	Water District	1,700	.038		Haverhill St.	T	32	12	G	1946
306	Russell	Municipal	1,200	.160	1	Nr. Westfield R.	G	30	12	G	1932
307	Salisbury	W. S. Co.	2,600 W	0.502	2	Chase's Brook	D	40	22	G	1915
								41	16	G	1920
308	Salisbury		6,000 S		3	Chase's Brook	Gp	45	18	G	1930 & 1949
309*	Sandwich	Water District	2,418	0.046	2	Tupper Rd.	Gp	65	2½	S	1947
310	Scituate	Municipal	5,993	0.901	35	Beaver Meadow	T	35-45	2½	S,G	1900-04
311	Scituate				16	Webster Meadow	T	44-66	2½	S,G	
312	Scituate				1	Bound Brook	G	21	18"	G	
313	Scituate				1	Kent St.	Gp	65	16"	G	
314	Scituate				1	Steams Meadow #17	Gp	72	24"	G	
315*	Scituate				1	Route 3A	Gp	55'	24	G	1955
316*	Seekonk	Water District	6,104	.241	48	Coles Brook	T	29'	2½"		
317*	Seekonk				1	Newman Ave.	Gp	59	6"	C	1952
318	Sharon	Municipal	4,800	0.635	40	Beaver Hole Meadow	T	19-50	2½	S	1906, 1923
319	Sharon				1	Beaver Hole Meadow	D	16	16	S	1885
320	Sharon				8	Beaver Hole Meadow	T	21-30	2½	S	1901, 1911

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
295		.20	20	6.4	10		None	C	300		
296		.01	22	6.1	15		None	D	600		
297*		.02	8	5.9			Kc				
298		.06	20	6.3	13			D	690		
299		.37	21	6.5	3		Ac				
300*	700	.02	18	6.1		.00			700		
301*		.07	20	6.3							
302		0.42	40	5.9	43		Ac, Fs	C			
303*		0.32	38	6.5							
304		.01	28	6.1	14						
305		.05	99	7.5				C			
306		.02	24	6.3	85						
307		.95	96	6.9			None	D	400		
308		.34	54	7.4	—		None	T	700		
309*		.09	19	6.1			Kc				
310		.02	54	6.4							
311		.33	52	6.4							
312		.25	29	6.4							
313	200										
314	350	.02	33	6.4							
315*	540	.05	28	6.5							
316*	200	.06	69	6.8							
317*		.03	50	6.3							
318		.90	26	6.5			None	C	580		
319		.04	60	6.7			None	D	500		Abandoned
320											

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
321*	Sharon (cont.)	Water Dept.	4,847	0.589	1	Beaver Hill	Gw	42	48	S	
322*	Sharon				1	Farnham Rd.	Gw	45	48"		1952
323	Sheffield	Water Co.	895		3	East of Town	S				1897, 1934
324*	Shelburne Falls	F.D.			1	North River	Gp	40	24"	S,G	1950
325	Shirley	Shirley Village W.D.	4,270	0.101	1	Nr. Catecunemaug	D	10	50'		1903
326	Shirley				4	Nr. Catecunemaug Brook	D	15	18.5'		1909
327*	Shirley				1		Gd	44	12"	G	1951
328	Shrewsbury	Municipal	10,500	.704	2	South St.	Gp	30	10"		1933
329	Shrewsbury				3	Oak St.	Gp	27	10"		1934
330*	Shrewsbury				2	No. Quinsigamond Avenue	Gp	57	8"	G	1949-50
331	Somerset	Municipal	8,566	0.585	45	Brook St., Dighton	T	28-35	2½"	S,G	1926-27
332*	Somerset				3	Dighton	Gp				
333*	Somerset				1	High St.	Gp				
334	South Hadley	Fire Dist. No. 2	10,146	0.700	2	Elmer Brook	D	12	25'	G	1911
335	South Hadley							12	30'	G	1911
336	Sterling	Municipal	2,166	0.089	12	Worcester Rd.	T	25	2½"		1934
337	Sterling						Gp		12"		1954
338	Stockbridge	Hill Water Co.	2,311	0.198	2	Rattlesnake Mt.	S				1860
339*	Stoughton	Municipal	11,100	.787			T				
340*	Stoughton						Gp				1955
341	Sturbridge	Municipal	2,805	.138	15	Chamberlain Supply	D				
341A						Brook below Cedar Pd.	T	25	2½"		1935
342	Sudbury	Water District	2,500	0.076	15	Hop Brook	T	34-62	2½"	S,G	1936
343	Sutton	Water Co.			1	Leland Hill	D	22	14'		1914
344	Sutton				1	Leland Hill	T	285	6"		1917
345*	Sutton	Manchaug Water Dist.	500	.016	2	Manchaug	Gp	32	8"		1952
345A*	Swansea	Water District			3	Midwood	Gp	20'	24"		1948
345B*					2	Maher Field	Gp	28'	24"		1948

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
321*		.40	38	6.2				C			
322*		.01	34	6.3				C			
323		.03	18	6.5	65		None	C			
324*	300	.04	53	6.7			None	T			
325		.04	57	5.7	21						
326											
327*		.02	36	6.3		.00					
328		.07	40	5.9	23		None	D	320		
329		.02	31	6.0	19		None	D	650		
330*	450	.01	29	5.9	23		Kc				
331		.03	33	8.4			Kp	D	450		
332*		.04	55	6.5		.13					
333*		.08	52	6.2							
334		.01	37	6.7	5.0		None	C	300		
335								D	300		
336		.01	30	6.4	26	.00	None	C	110		
337											
338		.11	43	7.0	23		None	G			
339*		.02	25	6.8		.00	Kp				
340*		.15	34	7.5							
341		.07	24	6.3		.00	None	C	150		
341A		1.1	28	6.0		.07					
342		.04	42	6.7			None	C			
343		2.6	65	6.9	5		None	G			
344		.03	46	6.1			None	D	10		
345*	250								204		
345A* 345B*		.04	45	6.1		.00	Kc	C	650		

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
346*	Templeton	Municipal	4,757	0.148	1	Otter River	Gp	42	24"		1949
347*	Tewksbury	Municipal	7,505	0.282	2	No. Whipple Rd.	Gp	55			
348	Tisbury	Municipal	1,930	1.930		Tashmoo Pond	S	14	20' x 80'		1887
											1935
349*	Tisbury				1	Vineyard Haven	Gp	110	12"	S	1952
350*	Topsfield	Municipal	1,412	0.057	20	North St.	T	33	2½"		1954
351	Townsend	Municipal	2,817	0.262	36	Joslm-Weston Meadow	T	39	2½"		1934
352	Upton	Municipal	600	0.029	12	Adj. to West River	T	41	2½"		1912
353	Uxbridge	Municipal	7,007	0.434	16	Old gp. no. West River	T	30	2½"		1904
354	Uxbridge	Municipal			17	New gp. nr. West River	T	33	2½"		1923
355*	Uxbridge	Municipal			2		Gp	64	2½"	S	1952
356	Wakefield	Municipal	19,633	1.431	27	Saugus River Valley	T	30-50	2½"	S	1930-31
356A											
357	Walpole	Municipal	9,109	1.414	10	Low Brook	T	28-70	2½"	G	1895
358	Walpole				30	Low Brook	T	28-70	2½"	G	1895
359	Walpole				101	Low Brook	T	29-66	2½"	G	1918-30
359A*	Walpole				1	Mine Brook	Gw	36	24"	S,G	1953
360	Waltham	Municipal	43,600	3.560	1	Pump Sta. #1 Charles River	D	30	41'	G	1891
361	Waltham				1	Pump Sta. #2 Charles River	D	35	30'	G	1908
362	Ware	Municipal	7,517	0.670	1	Nr. Muddy Brook	D	25	26'	G	1887
363	Ware				41	Nr. Muddy Brook	T	35	2½"	G	1924
364	Wareham	Fire District	7,569	0.920	21	Tihonet Pond	T	—	2½"	S,G	1907,35
365	Wareham				2	Tihonet Pond	G	32,37	18"	S,G	1940
366*	Wareham				3	Maple Spring	Gp	63	8"	S	1953
366A*	Wareham	Onset Fire District			1	Near Sandy Pond	Gw	67	24"	S,G	1954
370	Warren	Water District	3,406		23	Outlet of Comins Pond	T	45	2½"		1923
371	Warren	W. Warren Water Co.			1	Adj. to Tufts Brook	D	18	20&60		1915
372	Warren	W. Warren Water Co.			1	Adj. to Tufts Brook	D	18	12'		1920

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
346*		.03	37	7.9		.00		T	275		
347*	225	.07	25	6.6		.03	Kc				
348		.16	72	5.9	13	.00	None		800		
349*	1,000	.02	9	6.2				C			
350*		.04	47	6.7		.00					
351		.02	12	5.7	19		None	C	300		
352		.16	30	6.1	24		None	C			
353		.04	26	6.1	33		None	C	500		
354		.09	23	6.0			Kc				
355*		.01	29	6.0			Kc		610		
356		.03	87	6.6			None	D			
356A		.06	92	6.2							
357		.07	27	6.3			None	C	2,100		
358											
359											
359A*	710	.02	24	6.2	20	.00		T			
360		.83	45	6.5				D	3,475		
361		.03	33	6.4				D	3,475		
362		.17	33	7.0	13.5		Kp	C	2,400		Can be flooded
363		.14	59	6.4			Kp				
364		.07	12	5.4	21			D	600		
365											
366*	936	.09	10	5.7				T			
366A*	430	.00	16	6.2	9	.00	Kp				
370		.06	16	6.1			None	D	400		
371		.15	16	6.0			None	G			
372							None	G			

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
373	Wayland	Municipal	4,407	0.630	30	Baldwin Pond	T	35-60	2½	S,G	1925
374					1	Baldwin Pond	Gp	48	6	S,G	1933
375*					1	Happy Hollow	Gp	66	18	S	1952
376*					1	Baldwin Road	Gp	52	24	S	1954
377	Webster	Municipal	13,194	0.965	1	Shore of Webster L.	D	30	25		1893
378					14	Shore of Webster L.	T	40	6		1903
379					103	Shore of Webster L.	T	40	2½		1901,24, 26,36
380*					1	Second Island Rd.	Gp	56	18		
381	Wellesley	Municipal	20,549	1.897	33	Rosemary Brook	T	30-65	2½	S,G	1898
382					17	Rosemary Brook	T	30-65	2½	S,G	1915
383					1	Rosemary Brook	T	31	10	G	1924
384					1	Rosemary Brook	D	40	25	S,G	1927
385					1	Morse's Pond	G	69	24	S,G	1937
386*					2	Morse's Pond	Gp		24		
387*	Wenham		1,644	0.110	1	Pleasant St.	Gp	53	24"		1953
388*	West Boylston	Water District	2,570	0.252	2	Off Lee St.	Gp	50	10		1952
389*	West Bridgewater	Municipal			6	Vital Ave.	T	38	2½		1945
390	West Brookfield	Municipal	1,387	0.091	10	Shore of Wickaboag Pond	T	27	2½		1912
391*					1	Shore of Wickaboag Pond	Gp	56	12	G	1951
392	West Stockbridge	Water Co.	425				S				1873
393	Westford	Water Co.	4,262	0.204	7	Gilson's Brook Val.	T	38-41	2½	G	1920
394					19	Stony Brook Meadow	T	35-46	2½	G	1907-17
395					1	Stony Brook Meadow	D	34	?	G	1917
396	Westminster	Municipal	225	0.010	1	Hillside S.W. of Village	S	9	40		
397	Weston	Municipal	5,026	0.437	1	Cherry Brook (Warren Ave.)	D	22	10	S,G	1895

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
373		.15	51	6.5			None	D	450		
374											
375*		.01	58	6.3							
376*		.01	44	6.7							
377		.10	19	6.5	16		None	D	2,000		
378											
379											
380*	1,200	.08	35	6.4				C	1,000		
381		.03	75	6.4		.05		D	1,390		
382											
383								C	312		
384		.02	45	6.4				D	1,110		New dug well being installed, 1955
385		.03	58	6.7							
386*	150	.05	58	6.7			Kc	T			
387*	300	.04	87	7.1			None	T	300		
388*		.06	33	6.1			Kc				
389*	150	.04	36	5.9			Kc	C			
390		.47	21	8.1		.38	None	D	210		
391*	600	.37	21	8.1		.15					
392		.05	38	7.1	5		None	C			
393		.07	27	6.7	22		None	D	87		
394		.03	39	6.4	9		None	D	347		
395							None	G			
396		.62	24	6.2	5		None	G			
397		.07	42	6.2							

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
398	Weston (cont.)	Municipal			11	Cherry Brook (Warren Ave.)	T	22-25	2½	G,S	1900
399					12	Stony Brook (Kendall Green)	T	25-28	2½	G	
400					1	Riverside—Charles R.	Gp	70	24	S,G	1941
401					1	Charles River (Well A) Kendall Green	D	25	12		
402					1	Charles River (Well C)	D	30	20		
403*					1	Rt. 128 Nickerson	Gp	70	18	G	1953
404*	West Springfield	Municipal		27.700	1	Great Brook at	Gw	108	18	S,G	1954
					1	Westfield-	Gd	126	18	S,G	1945
					1	Southwick Line	Gd	137	18	S,G	1954
					3		Gw	45	12	S,G	1938
405*	Weymouth	Municipal	32,690	2.310	1	Off Main St.	Gp	65	24		
406*					1	Off Circuit Ave.	Gp	55	24		
407*	Williamsburg	Municipal	6,194		1	Off South Street	Gp	78½	12	R	1951
408	Williamstown	Municipal	6,194	0.681	2		S				1890
409	Wilmington	Municipal	7,039	0.849	42	Park & Lowell Sts.	T	45-85	2½"		
410*					15	Woburn St.	T	30	2½"	S	1954
411	Winchester	Municipal	15,500	1.529	25	Pond St.	T	25'	2½"		
412	Woburn	Municipal	19,750	1.504	1	Horn Pond	Gp	38	26	G	1927
413					1	Horn Pond	Gp	70	18		1932
414					1	Horn Pond	Gp	56	18		1932
415					1	Horn Pond	Gp	64½	18		1932
416					1	Horn Pond	Gp	89	18	G	1937
417					1	Horn Pond	D	30	20	G	1908
418*					1	Horn Pond	D	17	12	G	1873
419*					1	Fowle Brook	Gp	40	24	G	1937

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
398		.34	29	6.3							
399		.34	29	6.3							
400		.03	65	6.4							
401		.34	29	6.3				T			
402		.07	42	6.2							
403*	520	.03	65	6.4				T			
404*	763										
	763										
	1,350										
	361	.01	50	7.2							
405		.00	38	7.0	1			T			Emergency
406*	700	.56	39	5.9			Kc	T			Emergency
407*	432	2.6	14	7.1	10	.00					
408		.02	75	7.9			None	G			
409		.09	30	6.2	28		Kc	D			
410*	200	.11	30	6.1	10	.00	Kc	C			
411		.05	77	6.7			Fz		350		Auxiliary to surface sources
412		.50	66	6.7	13		None	T	1,040		
413	700	.01	71	6.8	27		None	T	1,150	1.350	
414		.03	59	6.6	20		None	T	940	.900	
415		.01	46	6.5							
416		.02	73	6.3							
417	1,730	.03	61	7.0	15		None	T	1,870	1.700	
418*	500	.07	47	6.8			Dc	C	1,870		
419*	900	.04	52	6.5	30		None	T	1,040	1.000	

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	City or Town	Utility	Population Served	Present Consumption M.G.D.	No. of wells	Location	Type of Well	Depth	Diameter	Well ends in	Date of Construction
420	Worthington	Fire District	175 W		4	1 mi. N.W. of Town	S				1911
421*			300 S			Ridge Road	A	100	6	R,G	1950
422	Wrentham	Municipal	5,341	0.292	1	Franklin St.	Gp		24"		1945
423	Yarmouth	Municipal	3,297 W	0.428	20	Union St.	T	35-47	2½"		1931-33
424*			7,800 S		1	Union St.	Gw	43	8"	G	1946
425*					3	West Yarmouth	Gw	60		S	1954

MASSACHUSETTS PUBLIC GROUND WATER SUPPLIES (*Continued*)

No.	Test Yield g.p.m.	Analysis					Treatment	Type of pump	Capacity of pump g.p.m.	Present daily pumpage, M.G.	Remarks
		Iron	Hardness	pH	CO_2	Manganese					
420		.09	19	6.7	2.0		None	G			
421*	75	.10	24	6.3		.02					
422		.03	26	6.0							
		.02	21	5.9			Kc				
423		.04	13	5.6	18			C	240		
424*	700	.01	14	5.7	18	.00	Kc				
425*		.30	14	6.1		.00					

REPORT OF COMMITTEE ON SPECIFICATIONS FOR CAST-IRON PIPE AND FITTINGS

September 1, 1956

To the New England Water Works Association:

ASA Committee A-21 on Specifications for Cast-Iron Pipe and Fittings (NEWWA Committee 21) has been inactive during the current year and is likely to remain so, unless requested to consider changes in the ASA Standards now in force as a result of the past efforts of this committee.

Representation of NEWWA on this committee should be continued, so that the members of the Association may be kept informed of any new developments which may be referred from time to time to Committee A-21.

Respectfully submitted,

(*Signed*) ARTHUR L. SHAW

COMMITTEE ON CODE FOR PRESSURE PIPING

Report of Activities of Committee B31 Code for Pressure Piping

To the New England Water Works Association:

At the annual meeting of Committee B31, Code for Pressure Piping, a suggestion was made by the then representative of the American Water Works Association that consideration be given to including pumping-station piping in the Code. It seemed to the writer that this was inadvisable for a number of reasons and, consequently, I communicated with Mr. Louis Howson, Chairman of the Water Works Practice Committee of the American Water Works Association, and with Mr. Harry E. Jordan, Secretary of that Association, expressing my views. They are in agreement with my views on the matter and, in all probability, water piping will not be included in the Code.

Shortly after this action was taken, the former representative of the American Water Works Association on Committee B31 asked to be relieved from his duties, and the writer was then appointed to represent the American Water Works Association.

Thomas F. Wolfe

PROGRESS REPORT OF COMMITTEE ON LAYING CAST-IRON WATER MAINS

To the Members of the New England Water Works Association:

As a result of your committee's recommendations, in 1954 the members of this Association adopted the procedure for disinfecting water mains, as set forth in the American Water Works Association of similar title and designation AWWA C 601-53T.

Your committee has cooperated with the AWWA in the development of the document, "Tentative Standard Specifications for Installation of Cast-Iron Water Mains," designation AWWA C 600-54T. Three points in these specifications will be of particular interest to members of this Association.

1. *Yarning or Packing Material.* Yarning or packing material for bell-and-spigot joints is specified to be one of the following:

a. Molded or tubular rubber rings;
b. Asbestos rope;
c. Treated paper rope.

Many health authorities having jurisdiction now require that newly laid water mains be disinfected before being put into service. Hemp and jute, formerly extensively used for packing joints, and cotton, occasionally used, possess characteristics which both promote the growth of bacteria and make disinfection of the materials and of water mains very difficult by the methods available in the field. Some localities prohibit the use of hemp, jute, and cotton for packing joints in water mains carrying potable water.

Your committee feels that by including only rubber rings or tubing, asbestos rope, or treated paper rope for packing bell-and-spigot joints, the specifications are in keeping with the best modern practice. It is urged that this practice be followed for work done by a Water Department's own forces or by contract.

2. *Jointing Materials.* Many widely scattered communities outside of New England have reported the need for extensive and cost-

ly repairs to pipelines jointed with sulfur compounds. Such, however, does not appear to have been the case in New England.

Because of this adverse experience record, the AWWA specifications omit sulfur compounds as one of the specified jointing materials. However, as a guide to those who wish to use this type of material, directions for its use are included in a suitably referenced Note. With the inclusion of these directions, your committee feels that the objection to omission of all reference to the sulfur compounds has been met.

3. *Mechanical-Joint Pipe.* Recognizing the increased use of mechanical-joint pipe, the AWWA specifications include directions for its jointing and a list of the suppliers of torque wrenches. Your committee considers that these are worthwhile additions.

It is understood that no further work on the AWWA "Tentative Standard Specifications for Installation of Water Mains," Designation AWWA C 600-54T, is in process. Therefore, your committee recommends that these specifications be published so that the members of this Association may consider their adoption.

Respectfully submitted,

(*Signed*) W. SEWARD MARINER, *Chairman*
GEORGE W. COFFIN

REPORT OF THE COMMITTEE ON SPECIFICATIONS FOR STEEL PIPE

September 6, 1956

To the New England Water Works Association:

This Committee of your Association acts jointly with Committee 8310D (formerly Committee E7A) of the AWWA on specifications for steel water pipe. At the annual meeting of Committee 8310D on May 8, 1956, the Steel Water Pipe Manufacturers' Technical Advisory Committee reported progress on the Steel Water Pipe Manual and indicated that a draft would be issued for criticism in about three months.

Tentative specifications for the dimensions of steel water pipe fittings, C208-55T, were approved by the AWWA July 14, 1955, and were published in the July, 1956, issue of the Journal of the AWWA.

Respectfully submitted,

(*Signed*) THOMAS R. CAMP, *Chairman*
CHESTER J. GINDER

REPORT OF COMMITTEE ON STANDARDIZATION OF PIPE FLANGES AND FITTINGS

September 1, 1956

To the New England Water Works Association:

Your representatives on ASA Committee B-16, Pipe Flanges and Fittings (NEWWA Committee 26) have kept in touch with the proceedings of that committee during the current year.

Work has been completed on American Standards for:

ASA B-16.25-1955, for Butt-Welding Ends for Pipe, Valves, Flanges and Fittings.

ASA B-16.23-1955, for Cast Brass Solder-Joint Drainage Fittings.

ASA B-16.20-1956, for Ring-Joint Gaskets and Grooves for Steel Pipe Flanges.

In process are numerous revisions of existing standards which are applicable mainly to fields other than water works. Nevertheless it is believed to be advantageous for NEWWA to continue representation on ASA Committee B-16, so that matters of interest to the waterworks profession may be brought promptly to the attention of its members.

Respectfully submitted,

J. PORTER HENNINGS
(*Signed*) ARTHUR L. SHAW

REPORT OF COMMITTEE ON CONSERVATION, DEVELOPMENT AND UTILIZATION OF WATER RESOURCES

September 17, 1956

To the New England Water Works Association:

In 1951 the Executive Committee established the Committee on Conservation, Development and Utilization of Water Resources for the purpose of keeping the Association informed as to developments then taking place toward the adoption of a national water policy, as well as all other matters relating to water resources.

This Association has on several occasions stressed the urgency of a national water policy, and President Eisenhower in 1954 stated that the establishment of such a policy with the Federal Government, the States and private agencies as co-partners would be a major objective of his administration. As a basis for legislation, the President at that time established a Cabinet Committee on Water Resources Policy (subsequently redesignated the Presidential Advisory Committee on Water Resources Policy) to review all aspects of water-resources policy and report its findings with recommendations.

In January, 1956, the President submitted to Congress the report of his water policy committee (House Document No. 315), accompanied by a Presidential letter proposing a long-range program for the conservation and use of the Nation's water resources—the first such program ever drafted and subscribed to by all Federal departments and agencies with a responsibility in this field. The report contained the following major proposals:

1. *Data.* To cope with growing water scarcity in some regions, disastrous floods in others, and the need to anticipate demands and problems of the future, that increased money and manpower be directed to collecting basic data on rainfall, stream flows and hydrology.

2. *Planning.* That planning of water-resources projects—involving supplies for domestic, industrial, agricultural, power and navigational needs, as well as flood control, recreational, conservation and

anti-pollution programs, be undertaken cooperatively by Federal, State and local agencies concerned.

3. *Execution.* That a four-point organization plan to carry out such projects be set up, providing for (a) regional water resources committees, embracing both State and Federal officials; (b) a Federal Inter-Agency Committee on Water Resources to advise the President and to be headed by (c) a Coordinator of Water Resources, which new post would be established in the Executive Office of the President; and (d) a Board of Review of Water Resources Projects—whose members would be totally separated from Federal Agencies and without involvement in projects coming before them—to be appointed by the President and report to him through the Coordinator.

The following additional policy recommendations are contained in the report:

That all aspects of potential water use be considered in the early planning stages of each project, to make certain that long-range uses are not overlooked.

That the principles which recognize water rights as property rights be accepted.

That uniform procedures be adopted by all Federal Agencies for evaluating costs and benefits of water-resources projects, in place of varying methods used heretofore; also that uniform standards be established for distributing costs among beneficiaries in proportion to benefits, and that the Federal government help State and local governments initiate their own projects.

That each major water-resources project be separately authorized by the Congress.

Congress has not yet taken action on the report, but Washington sources are of the opinion that legislation to carry the recommendations into effect will be a first order of business when the 85th Congress convenes in January.

During the past year the report on the $5 million survey of New England's natural resources, prepared by the New England-New York Inter-Agency Committee (NENYIAC), was forwarded to President Eisenhower. At the same time the Secretary of the Army submitted to Congress this 47-volume report, completed two years ago by the

seven Federal agencies and cooperating State agencies, with the recommendation that the complete document be printed in order to have the widest possible distribution. A development attributable to NENYIAC was action taken by the New England Governors' Conference advocating that the New England States participate in a Federal-State regional water-resources council or committee. The President's Inter-Agency Committee on Water Resources, appointed in 1944 to co-ordinate the work of Federal agencies in drainage basins throughout the country, has been considering the establishment of a Federal inter-agency group for New England. The proposal of the New England Governors' Conference provides for an inter-agency committee, but on a co-equal basis as between representatives of the States and of the Federal Government. The President's Inter-Agency Committee recently approved this proposal, and a charter for the organization of the New England Water Resources Committee is now in preparation.

Of particular interest in the conservation of our water resources was the recent enactment by Congress of a bill to extend and strengthen the Federal Water Pollution Control Act of 1948. This new law (Public Law 660 of the 84th Congress) places the legislation on a permanent basis and strengthens the anti-pollution enforcement powers of the Surgeon General in regard to interstate waters. Under the 1948 Act the Federal Government would take no action to enforce pollution control unless the States concerned granted their consent to such action, including the offending State. Public Law 660 requires only the consent of a State that is adversely affected by pollution which originates in another State. The law authorizes appropriations for grants to State and interstate agencies for their pollution control programs and to municipalities for the construction of sewage treatment facilities. Grants to municipalities are limited to 30 per cent of the estimated cost of the works or $250,000, whichever is the smaller. For the 1957 fiscal year Congress appropriated $2 million for grants to State and interstate agencies and $50 million for grants to municipalities for treatment plant construction.

More and more attention is being focused on the ever-increasing demands for water, which will require careful planning in the allocation and development of our vital water resources both locally and

regionally. Accordingly your Committee will continue to apprise the Association of activities in this field, in order that appropriate action may be taken for an expression of views on water-resources policies and legislation.

Respectfully submitted,

(*Signed*) THOMAS R. CAMP, *Chairman*
JOSEPH C. KNOX
HARRY MANSON

REPORT OF COMMITTEE ON METHODS OF FINANCING WATER MAIN EXTENSIONS

To the New England Water Works Association:

It is evident to your Committee after study and discussion that it would be impossible to make definite recommendations as to the correct methods to use in any particular case of financing main extensions, due to wide variations in local custom and practices and statutory requirements.

Our interim report was a tabulation of the various methods in use, broken down according to size of municipality and whether public or private supply. This was mailed to all members of the Association.

An interesting development in this field occurred in Massachusetts last year, when the Legislature voted to amend the Betterment Act to allow cities and towns and districts which accept the Act to lay mains and assess betterments on the abutting property for the whole or part of the cost. Several towns have already accepted this amendment.

In the future, as policies develop further, comparative studies could be made. Therefore we suggest that this Committee be continued on an inactive basis.

Respectfully submitted,

ALLAN F. MCALARY
SHERMAN L. ROGERS
(*Signed*) KENNETH W. ROBIE, *Chairman*

PROGRESS REPORT OF COMMITTEE ON RECREATIONAL USE OF PUBLIC WATER SUPPLIES

September, 1956

For this report a survey was made of the views of the Directors of the Division of Sanitary Engineering of the State Boards of Health. The following is a summary of the basic thinking of the Sanitary Engineers.

1. The highest primary use of a public water supply is for drinking purposes.
2. Any secondary use, such as recreational, ice cutting, etc., of a public water supply involves the possibility of a health hazard to the consumers of that supply.
3. The least possible pollution in a raw water supply provides the best guarantee of a safe treated water for drinking purposes.
4. The control of water supplies is a HEALTH function. Under the direction of dedicated professional men and women, the standards and quality control of water supplies have improved since the turn of the century to such an extent that sickness, due to water-borne diseases, has decreased and has been held to a minimum level for the last few years.
5. The proponents of recreational use of water supplies are often prone to base their arguments in favor of said use on the excellent quality and health record of our water supplies. The absence of water-borne disease in a community is not an indication that increased activity can be permitted on a source of supply.
6. There continues to be a strong case for the necessity of maintaining rigid safeguards on water supplies. Important considerations are as follows:
   a. Water will always remain a medium for the transmission of organisms that cause disease.
   b. There still are reservoirs of transmittable diseases.

c. There are recent records of gross pollution when the sources of water supplies were open to human activity.
d. There is a lack of trained personnel for water-treatment control, and poor control could result in explosive situations.
e. There are limits to the efficiency of treatment methods, in addition to those imposed by possible human error.

7. The responsibility of a Director of Sanitary Engineering of a Health Department is a health function. As it concerns water supplies, his duty is that of PREVENTING the spread of diseases and, to discharge that responsibility properly, he must exercise more than ordinary precaution, because he is dealing with a medium that can transmit disease to masses of population that may result in an incidence of infection of epidemic proportions.

Legislation Concerning Recreational Use of Water Supplies Due to Be Reported in 1956

New Hampshire

State Legislature, Chapter 368 of Laws of 1955, voted $5,000 for a study of the possibility of mutliple use of the Lake Massabesic region. The study is under the direction of the Council of Resources and Planning, which is composed of heads of departments of agencies interested in conservation.

Massachusetts

A report is due in December of 1956 on Chapter 67, Laws of 1954, on a Resolve Providing for an Investigation and Study by the Department of Public Health Relative to the Preservation of the Purity of Certain Water Supplies. The provisions of this resolve are a development based on the situation in Southeastern Massachusetts, which resulted in the filing of Senate 463, previously mentioned in this report.

This resolve requires an intensive study of present law and regulation, with a view to revision if feasible, as related to the general subject of protection of the purity of certain municipal water supplies, as said purity may be affected by public swimming,

bathing, boating, fishing, and other recreational use. In addition, the subjects of taking and holding land for municipal water-supply protection, and the cultivation of cranberry bogs with inherent plant disease and insect control, as related to municipal water-supply considerations, are due for thorough exploration.

Connecticut

A resolution was passed in the 1955 General Assembly to have the Governor appoint a committee to study the possibility of multiple use of water supplies and to report back to him on July 1, 1956. No report has been made to date.

Respectfully submitted,

(*Signed*) CLARENCE L. AHLGREN, *Chairman*
FREDERICK O. A. ALMQUIST
SIDNEY S. ANTHONY
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MEMOIR OF STEPHEN H. TAYLOR

Stephen H. Taylor was born in New Bedford, Mass., in 1872. After graduating from the New Bedford High School, he entered the Water Department in 1889. In 1904 he left the Water Department to enter private business. Later he was employed by the Associated Factory Mutual Fire Insurance Companies as an inspector.

In 1919 he returned to the New Bedford Water Department as Assistant Superintendent, subsequent to the retirement of Robert C. P. Coggeshall. On April 28, 1922, he was appointed Superintendent and continued in that capacity until fifteen years ago.

During his many years as the head of the New Bedford Water Department, many outstanding improvements were made. With the laying of large water mains and the increase in storage reservoirs, he gave to his city one of the finest water systems in the East.

Mr. Taylor, who died on November 22, 1955, at the age of 83, is survived by his wife and son. He had been an official in the department for 36 years, and superintendent for 18 years. He was very active in community affairs, having been President of the New Bedford Anti-Tuberculosis Association, an active Rotary member, and a member of other service organizations. He was a 32nd-degree Mason.

Mr. Taylor was Past President of the New England Water Works Association, serving during 1924-25. He became a member in 1919 and was made an Honorary Member in 1935. He served as Chairman of the New England Section of the American Water Works Association and was a member of the Board of Directors of that association for three years. He organized the Section while he was Director, and also served on several of the Association's committees. He took a very active part in organizing the cross-connection committee for the protection of the purity of public water supplies.

Mr. Taylor was a loyal friend and an inspiration to those entering the water-works profession. His contribution to the engineering and practical methods in the water-works field will be long remembered.

ROGER W. ESTY

MEMOIR OF SIR WILLIAM PATERSON

Sir William Paterson of London, England, a member of this Association since 1931, died on August 9, 1956, after a short illness.

William Paterson was born in 1874 in Scotland. He was educated in Edinburgh and, after technical training in Heriot Watt College, served an apprenticeship of six years with a firm of paper-mill engineers.

In 1902 he formed the company which bears his name, devoted to the design and construction of water-purification plants and equipment. He pioneered in various processes of water treatment, including excess lime for softening and sterilization, and ozone and chlorine gas for disinfection. In the course of his career he filed over 70 British patents.

Just prior to the second World War he was given the task of devising an air-raid shelter capable of rapid production at low cost. The design was patented and the patent presented to the nation. He received the honor of Knighthood in 1944. He was an Honorary Member of the Institution of Water Engineers and of the Royal Society of Health, an Honorary Fellow of the Heriot Watt College, and a Life Member of the American Water Works Association.

It was the writer's privilege to have known Sir William for the past quarter-century. He was a man whose ability and character were held in high esteem by the members of the water-works profession in England. As a host he was gracious and thoughtful and a most interesting companion. His accomplishments in the field of water treatment will long endure. The Association has lost one of its most eminent members.

E. SHERMAN CHASE

INDEX OF ADVERTISERS

	Page
Badger Meter Mfg. Co.	Following front cover
Bahr, Ray	xviii
B-I-F Industries, Inc.	Following front cover
Bingham & Taylor Corp.	Following front cover
Brown Co.	xviii
Caldwell Co., George A.	iv
Camp, Dresser & McKee	ii
Cast Iron Pipe Research Assn.	xxv
Cement Lined Pipe Co.	xviii
Centriline Corp.	Following front cover
Chapman Co., R. E.	ii
Coffin and Richardson	ii
Crosby, Irving B.	ii
Eddy Valve Co.	xii
Eureka Pipe Co., Inc.	xiv
Fairbanks, Morse & Co.	Following front cover
Fay, Spofford & Thorndike	ii
Flexible, Inc.	xviii
Ford Meter Box Co., The	Following front cover
Gunite Restoration Co., Inc.	ii
Haley & Ward	ii
Hays Mfg. Co.	xiii
Hazen & Sawyer	iii
Hersey Mfg. Co.	ix
Hileo Supply, Inc.	xix
Hydraulic Development Corp.	vii
Johns Manville Sales Corp.	viii
Keasbey & Mattison Co.	v
Kennedy Valve Mfg. Co.	xv
Knowles, Inc., Morris	ii
Layne-New York Co.	iii
Leadite Co.	Back cover
Leggette, Brashears & Graham	ii
Lock Joint Pipe Co.	Following front cover
Ludlow Valve Mfg. Co.	Following front cover
Maguire & Assoc., Chas. A.	iii
Maher Co., D. L.	iii
Metcalf & Eddy	ii
Mills Engineering Co., Inc.	xiv
Morris Knowles, Inc.	ii
Mueller Co.	Following front cover
National Water Main Cleaning Co.	x
Neptune Meter Co.	Following front cover
Pierce-Perry Co.	iii
Pipe Founders Sales Corp.	xiv
Pirnie, Malcolm	iii
Pitometer Assoc., Inc., The	iii
Pittsburgh-Des Moines Steel Co.	Following front cover
Pittsburgh Equitable Meter Div.	Following front cover
Pollard Co., Inc., Joseph G.	Following front cover
Prescott & Sons, Inc., H. R.	xvi
Proportioneers	iv
Public Works Supply Co.	xviii
Rensselaer Valve Co.	Following front cover
Rockwell Manufacturing Co.	Following front cover
Ross Valve Mfg. Co.	xvii
Smith and Norrington Engineering Corp.	iii
Smith Mfg. Co., The A. P.	Following front cover
Torrington Supply Co., Inc.	xvi
Turbine Equipment Co. of New England	Following front cover
U. S. Cast Iron Pipe & Foundry Co.	xxvi
Utilities Supply Corp.	xix
Wallace & Tiernan Co., Inc.	xi
Warren Foundry & Pipe Div., Shamoon Industries, Inc.	Following front cover
Weston & Sampson	iii
White Construction Co., R. H.	xiv
Whitman & Howard	iii
Wood Co., R. D.	Following front cover
Worthington-Gamon Meter Div.	vi

(Classified index on page xxiii)

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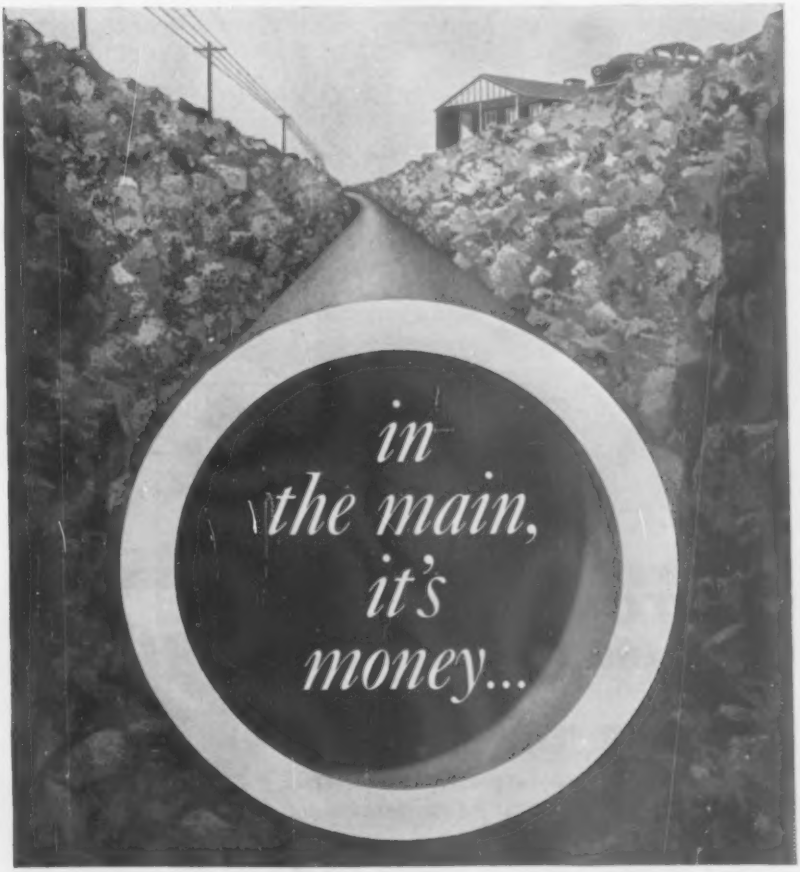

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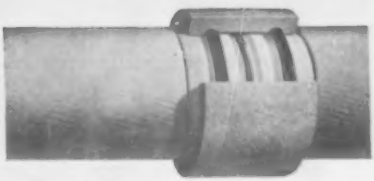

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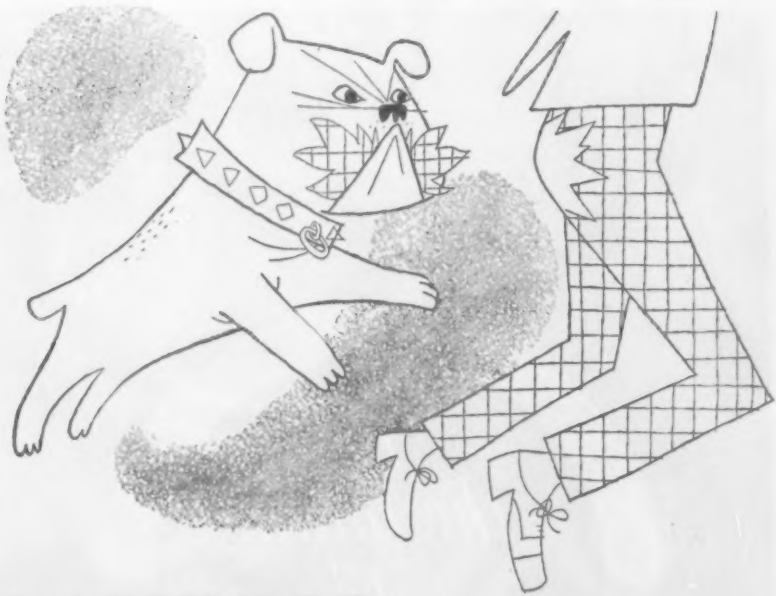

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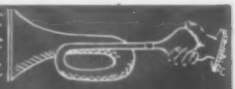

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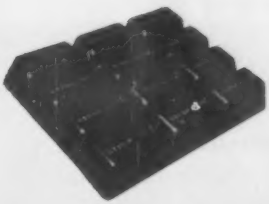

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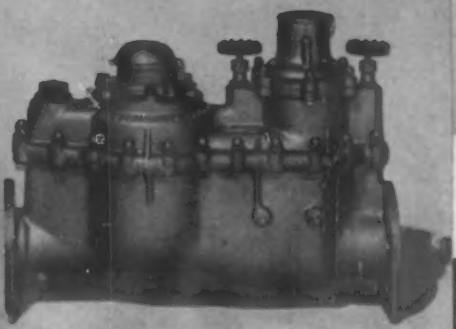

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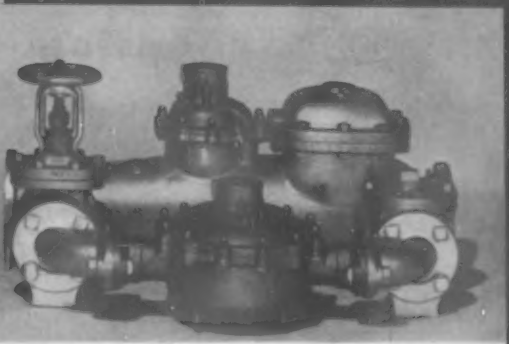

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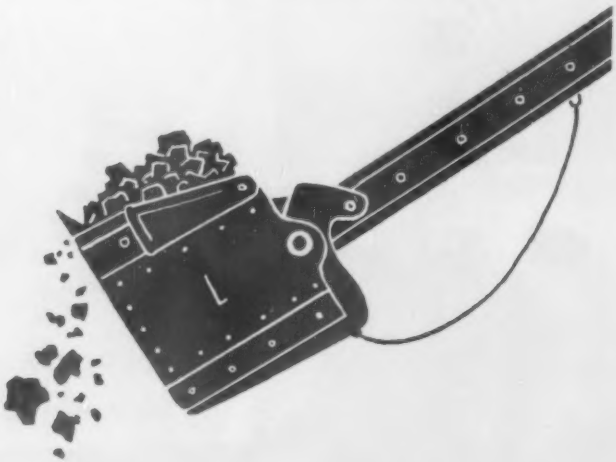

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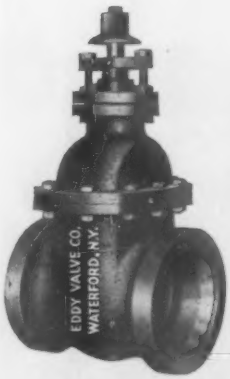

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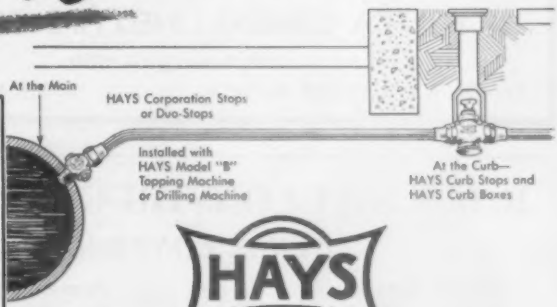

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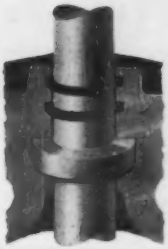

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Fig. 571

Fig. 561

Fig. 566

Fig. 566G

Fig. 566FTR

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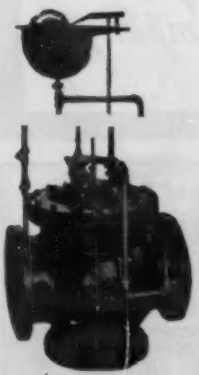

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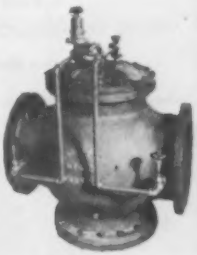

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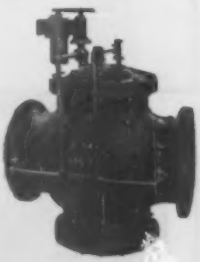

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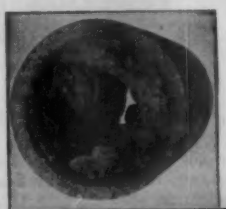

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CLASSIFIED DIRECTORY OF ADVERTISEMENTS

ASBESTOS-CEMENT PIPE.
Johns-Manville viii
Keasbey & Mattison Company v

BRASS GOODS.
Caldwell Co., George A. iv
Eureka Cement Lined Pipe Co. xiv
Hilco Supply xix
Mueller Co. ..... Following front cover
Pierce-Perry Co. iii
Torrington Supply Co., Inc. xvi
Utilities Supply Corp. xix

CALKING MACHINERY AND TOOLS.
Hydraulic Development Corp. vii
Mueller Co. ..... Following front cover

CAST IRON PIPE. (See Pipe, Cast Iron.)

CEMENT LINED PIPE. (See Pipe, Cement Lined.)

CHEMICAL FEED APPARATUS.
B-I-F Industries ..... Following front cover
Wallace & Tiernan Co., Inc. xi

CHLORINATORS.
B-I-F Industries ..... Following front cover
Wallace & Tiernan Co., Inc. xi

CLARIFIERS.
Mills Engineering Co., Inc. xiv

CLEANING WATER MAINS.
Flexible Pipe Cleaning Co. xviii
National Water Main Cleaning Co. x

COCKS, CURBS AND CORPORATIONS.
Caldwell Co., George A. iv
Eureka Cement Lined Pipe Co. xiv
Hays Mfg. Co. xiii
Mueller Co. ..... Following front cover
Pierce-Perry Co. iii
Utilities Supply Corp. xix

CONCRETE PIPE. (See Pipe, Concrete.)

CONTRACTORS' EQUIPMENT.
Hydraulic Development Corp. vii

CONTRACTORS.
Layne-New York Co., Inc. iii
Maher, D. L. Co. iii
White Construction Co., R. H. xiv

COUPLINGS, FLEXIBLE PIPE.
Caldwell Co., George A. iv
Public Works Supply Company xviii

CURB BOXES.
Bingham & Taylor Corp. ..... Following front cover
Caldwell Co., George A. iv
Eureka Cement Lined Pipe Co. xiv
Hays Mfg. Co. xiii
Hilco Supply xix
Mueller Co. ..... Following front cover
Pierce-Perry Co. iii
H. R. Prescott & Sons, Inc. xvi
Public Works Supply Company xviii
Utilities Supply Corp. xix

DIAPHRAGMS, PUMPS.
Joseph G. Pollard Co. ..... Following front cover
Proportioneers, Inc. (B-I-F Industries) iv

EJECTOR, PNEUMATIC.
Mills Engineering Co., Inc. xiv

ENGINEERS.
Camp, Dresser & McKee ii
Coffin & Richardson ii
Crosby, Irving B. ii
Fay, Spofford and Thorndike ii
Haley and Ward ii
Hazen and Sawyer iii
Knowles Morris, Inc. ii
Leggette, Brashears & Graham ii
Maguire & Associates, Charles A. iii
Metcalf and Eddy ii
Pirnie Engineers, Malcolm iii
Pitometer Associates, Inc., The iii
Smith and Norrington iii
Weston and Sampson iii
Whitman and Howard iii

ENGINES. (See Pumps and Pumping Engines.)

EQUIPMENT. (See Contractors' Equipment.)

CLASSIFIED DIRECTORY OF ADVERTISEMENTS *(Continued)*

FEED WATER FILTERS.
Proportioneers, Inc. (B-I-F Industries) iv
Ross Valve Mfg. Co., Inc. xvii

FILTRATION PLANT EQUIPMENT.
B-I-F Industries ..... Following front cover
Mills Engineering Co., Inc. xiv

FLAP VALVES.
Eddy Valve Co. xii

FLEXIBLE JOINTS.
U. S. Pipe and Foundry Co. xxvi

FURNACES.
Hilco Supply xix
Hydraulic Development Corp. vii
Leadite Co., The ..... Back cover
Mueller Co. ..... Following front cover
Pollard Co., Joseph G. ..... Following front cover
H. R. Prescott & Sons, Inc. xvi
Public Works Supply Company xviii
Utilities Supply Corp. xix

GATE VALVES. (See Valves.)

GEARS.
Mills Engineering Co., Inc. xiv

GUNITE CONSTRUCTION.
Gunite-Restoration Co., Inc. ii

HOSE, SUCTION AND CONDUCTION.
H. R. Prescott & Sons, Inc. xvi

HYDRANTS, FIRE.
Caldwell Co., George A. iv
Eddy Valve Co. xii
Hilco Supply xix
Kennedy Valve Mfg. Co. xv
Ludlow Valve Mfg. Co. ..... Following front cover
Mueller Co. ..... Following front cover
H. R. Prescott & Sons, Inc. xvi
Public Works Supply Company xviii
Rensselaer Valve Co. ..... Following front cover
Smith Mfg. Co., The A. P. ..... Following front cover
Utilities Supply Corp. xix
Wood, R. D., Co. ..... Following front cover

HYDRANTS, PUMPS.
Hilco Supply xix
Joseph G. Pollard Co. ..... Following front cover
H. R. Prescott & Sons, Inc. xvi

LEAD PIPE. (See Pipe, Lead.)

LIQUID CHLORINE.
Brown Co. xviii

METERS, OIL AND WATER.
Badger Meter Mfg. Co. ..... Following front cover
B-I-F Industries ..... Following front cover
Hersey Mfg. Co. ix
Neptune Meter Co. ..... Following front cover
Pipe Founders Sales Corp. xiv
Pittsburgh Equitable Meter Div. ..... Following front cover
Worthington-Gamon Meter Div. vi

METER COUPLINGS.
Badger Meter Mfg. Co. ..... Following front cover
Caldwell Co., George A. iv
Ford Meter Box Co. ..... Following front cover
Hays Mfg. Co. xiii
Hersey Mfg. Co. ix
Mueller Co. ..... Following front cover
Neptune Meter Co. ..... Following front cover
Public Works Supply Company xviii
Worthington-Gamon Meter Div. vi

METERS (Venturi Type.)
B-I-F Industries ..... Following front cover

METER BOXES.
Bingham & Taylor Corp. ..... Following front cover
Ford Meter Box Co. ..... Following front cover
Mueller Co. ..... Following front cover
Public Works Supply Company xviii

METER TESTERS.
Badger Meter Mfg. Co. ..... Following front cover
Ford Meter Box Co. ..... Following front cover
Mueller Co. ..... Following front cover
Neptune Meter Co. ..... Following front cover
Public Works Supply Company xviii

OIL ENGINES.
Fairbanks, Morse & Co. ..... Following front cover

PIPE, ASBESTOS-CEMENT.
Johns-Manville viii
Keasbey & Mattison Company v

CLASSIFIED DIRECTORY OF ADVERTISEMENTS *(Continued)*

PIPE, BRASS.
Caldwell Co., George A. iv
Hilco Supply xix
Pierce-Perry Co. iii
H. R. Prescott & Sons, Inc. xvi
Torrington Supply Co., Inc. xvi
Utilities Supply Corp. xix

PIPE, CAST IRON (and Fittings.)
B-I-F Industries ..... Following front cover
Bingham & Taylor Corp. ..... Following front cover
Cast Iron Pipe Research Association xxv
Hilco Supply xix
Pipe Founders Sales Corp. xiv
H. R. Prescott & Sons, Inc. xvi
U. S. Pipe and Foundry Co. xxvi
Utilities Supply Corp. xix
Wood, R. D., Co. ..... Following front cover

PIPE, CEMENT LINED.
Cast Iron Pipe Research Association xxv
Cement Lined Pipe Co. xviii
Eureka Cement Lined Pipe Co. xiv
Pipe Founders Sales Corp. xiv
U. S. Pipe and Foundry Co. xxvi
Utilities Supply Corp. xix

PIPE, COATING AND LININGS.
Centriline Corp. ..... Following front cover

PIPE, CONCRETE.
Lock Joint Pipe Co. ..... Facing front cover

PIPE CUTTING MACHINES.
Caldwell Co., George A. iv
Pollard Co., Joseph G. ..... Following front cover
Smith Mfg. Co., The A. P. ..... Following front cover

PIPE JOINTING MATERIAL.
Caldwell Co., George A. iv
Hilco Supply xix
Hydraulic Development Corp. vii
Leadite Co., The ..... Back cover
Utilities Supply Corp. xix

PIPE, LEAD.
Pierce-Perry Co. iii

PIPE LINING.
Cement Lined Pipe Co. xviii
Centriline Corp. ..... Following front cover

PIPE, PRESTRESSED CONCRETE.
Lock Joint Pipe Co. ..... Facing front cover

PIPE, WROUGHT IRON AND STEEL.
Pierce-Perry Co. iii
Torrington Supply Co., Inc. xvi

PLUG VALVES.
Eddy Valve Co. xii
Hays Mfg. Co. xiii
Mueller Co. ..... Following front cover
Pittsburgh Equitable Meter Div. ..... Following front cover

PITOMETERS.
Pitometer Associates, Inc., The iii

PORTABLE AIR COMPRESSORS. (See Air Compressors.)

PRESSURE REGULATORS.
Hilco Supply xix
Mueller Co. ..... Following front cover
Pittsburgh Equitable Meter Div. ..... Following front cover
H. R. Prescott & Sons, Inc. xvi
Ross Valve Mfg. Co., Inc. xvii

PROVERS, WATER.
Badger Meter Mfg. Co. ..... Following front cover
Ford Meter Box Co. ..... Following front cover

PUMPS AND PUMPING MACHINES.
Fairbanks, Morse & Co. ..... Following front cover
Layne-New York Co., Inc. iii
Hilco Supply xix
Maher Co., D. L. iii
Mills Engineering Co., Inc. xiv
Joseph G. Pollard Co. ..... Following front cover
H. R. Prescott & Sons, Inc. xvi
Ross Valve Mfg. Co., Inc. xvii
Turbine Equipment Co. ..... Following front cover
White Construction Co., R. H. xiv

RATE CONTROLLERS AND GAUGES.
Badger Meter Mfg. Co. ..... Following front cover
B-I-F Industries ..... Following front cover

REDUCERS, SPEED.
Mills Engineering Co., Inc. xiv

SHEAR GATES.
Eddy Valve Co. xii
Mueller Co. ..... Following front cover

CLASSIFIED DIRECTORY OF ADVERTISEMENTS *(Continued)*

SLEEVES AND VALVE TAPPINGS.
Caldwell Co., George A. iv
Eddy Valve Co. xii
Hilco Supply xix
Ludlow Valve Mfg. Co. ..... Following front cover
Mueller Co. ..... Following front cover
H. R. Prescott & Sons, Inc. xvi
Public Works Supply Company xviii
Rensselaer Valve Co. ..... Following front cover
Smith Mfg. Co., The A. P. ..... Following front cover
Utilities Supply Corp. xix

STEEL PLATE WORK.
Pittsburgh-Des Moines Steel Co. ..... Following front cover

STRAINERS.
Mills Engineering Co., Inc. xiv

SUPPLIES AND TOOLS.
Caldwell Co., George A. iv
Hilco Supply xix
Hydraulic Development Corp. vii
Leadite Co., The ..... Back cover
Mueller Co. ..... Following front cover
Pierce-Perry Co. iii
Pollard Co., Joseph G. ..... Following front cover
H. R. Prescott & Sons, Inc. xvi
Public Works Supply Company xviii

TAPPING MACHINES.
Caldwell Co., George A. iv
Hays Mfg. Co. xiii
Mueller Co. ..... Following front cover
Smith Mfg. Co., The A. P. ..... Following front cover

TANKS, STEEL.
Pittsburgh-Des Moines Steel Co. ..... Following front cover

TAPPING SLEEVES. (See Sleeves and Valves, Tappings.)

VALVE BOXES.
Bingham & Taylor Corp. ..... Following front cover
Caldwell Co., George A. iv
Eddy Valve Co. xii
Hilco Supply xix
Kennedy Valve Mfg. Co. xv
Mueller Co. ..... Following front cover
Pierce-Perry Co. iii
Pipe Founders Sales Corp. xiv
H. R. Prescott & Sons, Inc. xvi
Public Works Supply Company xviii
Smith Mfg. Co., The A. P. ..... Following front cover
Utilities Supply Corp. xix
Wood, R. D., Co. ..... Following front cover

VALVE AND GATE GENERATORS.
Mills Engineering Co., Inc. xiv

VALVE INSERTING MACHINES.
Mueller Co. ..... Following front cover
Smith Mfg. Co., The A. P. ..... Following front cover

VALVES, CHLORINE.
Wallace & Tiernan Co., Inc. xi

VALVES, GATE.
Caldwell Co., George A. iv
Eddy Valve Co. xii
Hilco Supply xix
Kennedy Valve Mfg. Co. xv
Ludlow Valve Mfg. Co. ..... Following front cover
Mueller Co. ..... Following front cover
Pierce-Perry Co. iii
H. R. Prescott & Sons, Inc. xvi
Public Works Supply Company xviii
Rensselaer Valve Co. ..... Following front cover
Smith Mfg. Co., The A. P. ..... Following front cover
Torrington Supply Co., Inc. xvi
Utilities Supply Corp. xix
Wood, R. D., Co. ..... Following front cover

VALVES, REGULATING.
Mueller Co. ..... Following front cover
Ross Valve Mfg. Co., Inc. xvii

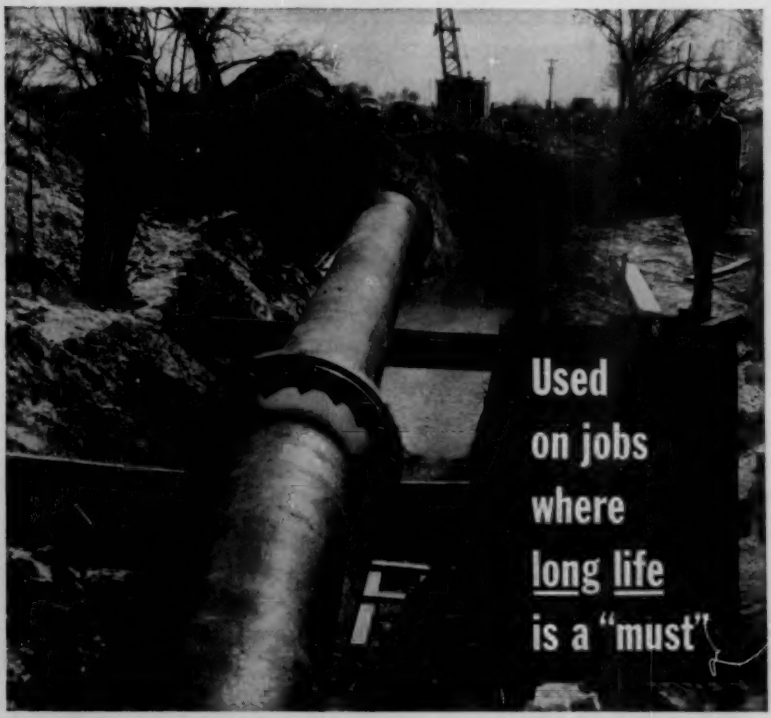
WASH FOUNTAINS.
Mills Engineering Co., Inc. xiv

WATER-PROOFING.
Gunite Restoration Co., Inc. ii

WATER WASTE DETECTION.
Pitometer Associates, Inc., The iii

WELLS, GRAVEL, FILTER AND DRIVEN.
Layne-New York Co., Inc. iii
Maher Co., D. L. iii

WROUGHT IRON PIPE. (See Pipe, Wrought Iron and Steel.)



Installing cast iron mechanical joint pipe across river at Salina, Kansas, for sewer main.

When an installation, once completed, should be as trouble-proof as planning and materials can make it—engineers rely on cast iron pipe. It has high beam-strength, compressive-strength and shock-strength. Its effective resistance to corrosion ensures long life, underground or underwater. These are reasons why cast iron pipe is so widely used for water lines in tough terrain, pressure and outfall sewers, river crossings, and encased piping in sewage treatment and water filtration plants. Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Ave., Chicago 3, Ill.

This 123-year-old cast iron water main is still in use in the distribution system of St. Louis, Mo.

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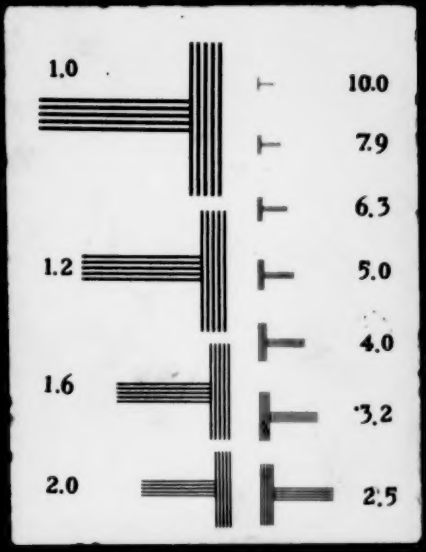

100 MILLIMETERS

INSTRUCTIONS Resolution is expressed in terms of the lines per millimeter recorded by a particular film under specified conditions. Numerals in chart indicate the number of lines per millimeter in adjacent "T-shaped" groupings.

In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and $100/20 = 5$.

Examine "T-shaped" line groupings in the film with microscope, and note the number adjacent to finest lines recorded sharply and distinctly. Multiply this number by the reduction factor to obtain resolving power in lines per millimeter. Example: 7.9 group of lines is clearly recorded while lines in the 10.0 group are not distinctly separated. Reduction ratio is 5, and $7.9 \times 5 = 39.5$ lines per millimeter recorded satisfactorily. $10.0 \times 5 = 50$ lines per millimeter which are not recorded satisfactorily. Under the particular conditions, maximum resolution is between 39.5 and 50 lines per millimeter.

Resolution, as measured on the film, is a test of the entire photographic system, including lens, exposure, processing, and other factors. These rarely utilize maximum resolution of the film. Vibrations during exposure, lack of critical focus, and exposures yielding very dense negatives are to be avoided.